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ABSTRACT

Presentations and critiques include these topics: determinants of college decisions; supply and demand in postsecondary education; shortcomings of models and data bases; effects of price and nonprice characteristics; and some methodoligical considerations. Discussion questions include: Is there a middle-income squeeze?; How can nonapplicants be reached?; What are the effects of student aid?; What further questions should be considered?; and What are the policy implications? A number of data tables on application, acceptance, attendence, and student characteristics are included. (MSE)

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TUITION AND STUDENT AID:

THEIR RELATION TO COLLEGE ENROLLMENT DECISIONS

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PREFACE

College and university officials, their representatives in the Washington higher education associations, and government policy-makers have become increasingly concerned about the price differential between public and private colleges (the "tuition gap") and its possibly deleterious effects on access and choice in postsecondary education. In the Congress and the state legislatures, this concern has taken many forms, including pressures on public institutions to raise their tuitions, calls for tax relief or student aid directed at middle-income groups, and proposals for increased public funding to keep private institutions in business. But despite the flurry of legislative activity in these areas, several fundamental questions--especially about the effect of tuition on the enrollment decisions of prospective students from different income levels--remain unanswered. If public policy is to be responsive to the changing conditions of postsecondary education and the changing needs of its clientele, two basic steps are required: first, research must be conducted into the price and nonprice determinants of postsecondary decisions (<u>whether</u> to attend college, and <u>which</u> college to attend); and second, policy-makers must be aware of the results of such research and must use such data as a guide in formulating and implementing effective programs.

On April 27, 1977, the Policy Analysis Service of the American Council on Education convened a seminar for the purpose of familiarizing federal policy-makers and Washington higher education representatives with new research on the relations between tuition, student aid, and college-going decisions. The morning session of the seminar opened with presentations describing three current research projects. These presentations were then critiqued by two researchers who have considerable expertise in the areas under consideration. The afternoon session was devoted to a general discussion of issues of major interest. The topics covered in the seminar included: (1) the effect of student aid on the tuition gap; (2) the differential impact of the tuition gap on prospective

students at different income levels and levels of ability; and (3) the policy implications of the new research results.

This report represents a condensed and edited version of the transcript of the seminar. It is being distributed to the participants, to selected federal and state education agency personnel, to congressional staff, and to other higher education researchers. A limited number of additional copies are available from the Policy Analysis Service, and the report will be submitted to the Educational Resources Information Clearinghouse (ERIC) system. We hope that this document will be useful in assessing the need for new or revised policies related to pricing and student assistance. Our thanks go to Ida E. Green for typing the report. We gratefully acknowledge the support received by PAS from the Lilly Endowment, which made possible the seminar and the publication of this report.

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MR. HUGHES: The topic of this seminar is the price differential between public and private higher education institutions, the so-called tuition gap. The discussion will focus on differences in the prices of various types of institutions and on the impact of these differences. The session will open with three presentations dealing with recent research on the subject; a brief question-and-answer session will follow each presentation. Then, Joseph Froomkin and Michael McPherson will critique the presentations. Since they did not have an opportunity to look over the papers beforehand, they will be faced with the difficult task of making ad hoc comments on what they hear.

Our first speaker is George Weathersby, of Harvard University, who will present some information that is having its first Washington exposure.

Determinants of College Decisions

MR. WEATHERSBY: First, I want to make some general comments about the work that has been done in several areas and then to look at some specific findings and conclusions; at that point, it would probably be appropriate for people to ask questions.

In the letters sent out prior to this seminar, three issues were raised: (1) To what extent do student aid programs help to bridge the tuition gap? (2) To what extent does the tuition gap vary as a function of income? and (3) To what extent do tuition and student aid affect enrollment decisions? The first two questions would seem to go together, and the main point I want to make in this connection is that, for low-income students, financial aid tends to narrow the tuition gap. Indeed, frequently the institution with the lowest tuition is not the institution with the lowest cost to the student, despite the common assumption that low tuition means low cost. In some states, it is the other way around: The community college is the highest-priced type of institution that a person from the lowest income group can attend; conversely, an apparently expensive private institution may cost the indi-

vidual less to attend. Various factors--including the federal government's basing financial aid on cost of attendance--have contributed to this paradoxical situation. It is important to keep in mind, then, not only the net price gap among institutions and for people at various income levels, but also the relation between the two.

A second fact to bear in mind is that, because of their price-discounting policies toward low-income students, and because a substantial amount of their price discounting comes from general revenues raised through tuition, independent institutions are raising the cost of education for all unaided students. Since a substantial number of students are in fact unaided, some fraction of the gap has to be charged to the institutions themselves. The largest single cost component at private institutions is accounted for by unfunded student aid.

A third point is that the concept of "the informed consumer" is unrealistic when it comes to higher education and should not be used as a basis for public policy. Most people have only a general idea of what it will cost them to attend college prior to the time they apply and are accepted. Information on the net price of college attendance could be made available, but currently it is not. On the other hand, survey findings indicate that estimates of the cost of college attendance made by high school students correlate closely with the actual costs reported by these same students as college freshmen. In other words, people have a fairly good idea of what the net cost will be at the institution they actually attend. Perhaps the main reason why so many people apply to only one institution is that they have cost information only on that one institution; the causal connection is not really clear.

A fourth point about college costs is that what a person actually pays is determined by a variety of factors: e.g., financial aid from BEOGs, SEOGs, state scholarships, private scholarships, veterans' and social security dependents' benefits, as well as decisions on pricing

made at different points, with the federal decision coming first, the state decision second, the institutional decision third. Thus, students and their families have different perceptions of the pricing environment at different points in the sequence, and these perceptions influence their decisions.

Predicting College-Going Behavior

Let me make some equally incendiary remarks about how tuition and student financial aid affect the individual's college-going decisions. First, research on this question has been conducted for over a decade now, and even though different researchers use different data bases, different samples, and different research designs, all these studies have produced remarkably similar results. A student's college decisions (that is, whether to go and where to go) can usually be predicted from his or her personal characteristics. To put it another way: With a simple linear model--using the individual's socioeconomic background, high school record, college plans and aspirations, etc., as the independent variables but not including any information about institutional characteristics such as pricing or about student financial aid--85 percent of the college decisions made by high school seniors can be predicted with accuracy. All the more sophisticated models that are designed to aid institutions and government agencies in making better pricing decisions and that use a wider array of variables, including financial aid and institutional characteristics such as pricing and selectivity, are trying to account for the remaining 15 percent of high school seniors' decisions.

Second--and somewhat surprising--is the point that most people apply to a single institution. The dominant pattern is for the individual to apply to one institution, to be accepted by that institution, and to attend that institution. Very few people are rejected by the institution to which they apply, and in the case of multiple applications, even fewer are rejected by all the institutions to which they

apply. Thus, in my judgment, the goal of access has been achieved in this country, in the sense that the people who apply to college are rarely denied entry.

One implication of this single-application phenomenon is that, contrary to the assumption of many people, most prospective college students do not make a choice among multiple alternatives. Only about one-third (or even fewer) applicants have two or more offers to consider. It is simply not the case that, come April 1, a person gets letters of admission from seven different institutions, with different financial aid offers or possibilities for packaging financial aid connected to each, and then must select from among the many options. When we talk about the effect of pricing on student decisions, we are talking about a choice that is made very early, when people first decide to apply, rather than very late, when they must decide among multiple acceptances.

Our research reveals that the effects of pricing (i.e., tuition and other costs of attendance) are significant but small in magnitude and are negative. The effects of financial aid, on the other hand, are significant, are positive, and (depending on how one disaggregates the aid) are somewhat larger than the pricing effects. In the past, it was generally assumed that grant assistance was just a negative form of tuition. But, in disaggregating the data, we have found that aid effects are larger in magnitude, and opposite in sign, from pricing effects.

Another point to emerge from our research is that being given a grant has a much more significant impact on college decisions than does the amount of the award itself (within a range of about $200-$1,200). This implies that eligibility patterns for grant assistance are more important than the magnitude of funding, given some reasonable minimum level of grant assistance. To put it another way: If I had to choose between providing full funding to all those now eligible for grant assistance and extending eligibility to those not now eligible, I would argue in favor of the latter. The "Kaiser cement" attitude of current grant

programs--find a need and fill it--is probably not nearly as effective as expanding the eligibility criteria would be.

The next question is, How do financial aid offers affect the individual's choice among several institutions? Again, it is the granting of the award that has the largest effect. If an applicant is accepted by two institutions, and if one offers a grant while the other does not, the applicant is more likely to choose the institution that offers the grant, even if the total costs of the two institutions are appproximately the same after the grant. In other words, when the effect of a grant is factored out, the effect of total cost on the individual's college choice is very small. As follows from that, if both institutions offer the applicant a grant, then those offers tend to cancel one another out as far as effects on college choice are concerned.

Getting back to the tuition gap: It is commonly believed that a person accepted at both a relatively high-cost and a lower-cost college will always choose the lower-cost institution, but there is little evidence to substantiate that belief. The effect of receiving aid, in terms of altering attendance patterns, is a very weak function of socioeconomic status and parents' income, although both these factors make themselves felt through a number of other more important factors, such as the student's degree aspirations, career plans, and so forth.

Those are just background comments, some of them based on the doctoral dissertation work of Greg Jackson, who is here today and who has put together some of the tables that we will look at now.[1] The first of these (Table 1) is from the study of price response coefficients conducted about four years ago by the National Commission on the Financing of Postsecondary Education; the council staff recomputed the original figures and found that they all needed to be lowered by only two-tenths

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1. All tables are in a separate section at the back of this report.

of a decimal point. This table shows that the cross-price effects (that is, the effects of price changes in other institutional sectors) were only about one-tenth as great as the own-price effects. Going back as far as the analyses that came out of the Miller-Radner models in the early 1960s, we find that enrollment changes resulting from price changes in other sectors were relatively small. For instance, price changes in private four-year colleges had the greatest effect on enrollment in private four-year colleges but relatively small effects on enrollments in two-year private colleges, two- and four-year public colleges, and institutions in the noncollegiate sector of postsecondary education. Further, cross-price elasticity for changes in price in the upper division are very similar for public and for private institutions, so one would not expect substantial differences in price sensitivity by type of institution.

Patterns of Application, Acceptance, and Attendance

Table 2--based on a sample of 1972 high school seniors who were followed up in the National Longitudinal Study (NLS)--shows relationships between applications, acceptances, and attendance patterns. These individuals are grouped according to the number of college applications they made (from none to three); and each of these groups is further subdivided according to whether they were accepted or rejected by each of their chosen institutions. The first four columns of figures are self-explanatory. Columns 5 through 10 show the proportions attending their first-choice institution, their second-choice institution, their third-choice institution, some other collegiate institution, some school not in the collegiate sector, and not attending any postsecondary institution. The last two columns show the college acceptance rate and the college attendance rate for each of the major groups.

For instance, let's look at those 1972 high school seniors who applied to two colleges: 542 out of the total sample of 5,179, or 10.5 percent. They are divided into four subgroups: those rejected by both

their choices (RR); those rejected by their first-choice college and accepted by their second-choice institution (RA); those accepted by their first choice and rejected by their second choice (AR); and those accepted by both institutions to which they applied (AA). Of the two-application groups (which totaled 542), only thirteen (2.4 percent) were rejected by both their choices; only fifty-six (10.3 percent) by their first-choice institution; only forty-one (7.6 percent) by their second-choice institution. Close to four in five (431 of 542) were accepted by both of the institutions to which they applied.

Several points about this table deserve mention. First, look at the top row, showing the high school seniors who made no college applications. Close to one-quarter (22.4 percent) of this group actually attended college. So the first surprise is that a substantial number of people who go to college never made a prior application. Those of us from California understand this, since all one has to do to enroll in one of our colleges is to be 18 and alive and walk in at the end of June. In fact, a substantial number of institutions operate that way. Thus, policies based on assumptions about young people applying to college overlook an important component, at least in the public sector.

Second, the acceptance rate for those who do make prior applications to college (next-to-the-last column) is very high, 96.7 percent. Nationally, then, the "unacceptance" rate is only 3.3 percent. So we do not have a situation in this country where enormous numbers of young people are applying to college and being turned down; most are accepted somewhere. Of course, it might be maintained that applicants are being rejected by their first-choice college and that constitutes a problem. But, as one can work out from the table, 91.2 percent of all applicants are accepted at their first-choice institutions, so that problem really does not exist.

Third, of the 221 individuals in the three-application group who were accepted at all three of their choices (who constitute about

three in five of the total group), slightly over half actually enrolled in their first-choice college, but 14.2 percent did not enroll in post-secondary education at all.

Fourth, of the 1,316 individuals who filed only one application, over two in three ended up attending some college. Bearing this in mind--and remembering also that a substantial number of people who never apply nonetheless end up attending some college--then one can see that only a small group of young people will be affected by changes in pricing policies. Such changes will not affect those who have made only one application or no application. Thus, pricing policies affect only that 40 percent of the total applicant group who apply to two or more institutions.

The next three tables (Tables 3, 4, and 5) show the results of some simple linear regression analyses. The independent variables are student and institutional characteristics; the dependent variable is college attendance (versus nonattendance). Table 3 is cross-classified by region, Table 4 by high school grades, and Table 5 by socioeconomic background. Asterisks denote statistical significance at the .05 level. The main point about these tables is that relatively few variables were statistically significant. The best predictors of college attendance were the student's plans: that is, educational aspirations, and specific postsecondary plans to attend an academic institution or a vocational-technical school. On none of the three tables does total cost of the institution (tuition and fees, room and board, etc.) emerge as significantly related to college attendance. Receipt of aid itself is significant in only two cases.

Table 6 goes into more detail on the issue of multiple applications. Only when an individual applies to more than one college does the question of making explicit, informed choices arises, and only in this case do differential student aid policies and other institutional characteristics have any potential effect on an individual's choice.

The table shows selected characteristics of institutions applied to: by acceptance, preference, and choice. For instance, looking at the line showing total aid, one learns that the mean of total aid offered to individuals who made a single application was $188. In the case of those applying to two institutions, the mean amount of aid offered by the first-choice institution was $263; the second-choice institution offered $178. For those applying to three institutions, the first-choice institution offered an average of $373; the second-choice institution, $199; and the third-choice institution, $130. As the last row of the table shows, only 44 percent of those making more than one application ended up enrolling in their first-choice institution. Clearly, then, applicants do not always attend the institution that offers them the largest amount of student aid. The "summer applications" shown on the table are those people who had not applied to any college by the end of their senior year in high school but who later reported being enrolled in college; presumably, they had applied or had decided to attend at some time during the summer. Note that 80 percent of the summer applicants, but only 72 percent of the earlier applicants, attended public institutions. That 80 percent represents the highest proportion of any group attending public colleges.

Table 7 compares the characteristics of the college chosen (called "own") with the characteristics of the "other" college, which accepted the student but which he/she did not choose to attend, and which may or may not have offered financial aid. Again, there is a breakdown by socioeconomic status and by high school grades. In only one case did the total cost of the college have a significant effect: Students from middle socioeconomic levels tended not to choose the high-cost institution. Receiving some aid from an institution was significant in most cases: That is, students were likely to choose the college that offered them some aid over the college that did not offer them any aid. On the other hand, surprisingly enough, total aid had little effect.

MR. HUGHES: Does anyone have any questions?

The Preselection Process

MR. STAMPEN: Perhaps one reason why cost does not emerge as a major factor in these tables is that many young people make up their mind before they apply just what college they can afford to attend and therefore apply only to "affordable" colleges.

MR. WEATHERSBY: I think that preselection does indeed operate, though we don't know much about how it works. If so, price information provided in April is likely to have little impact on college decisions that have been made the previous October or even, in some cases, some years before that.

MR. STAMPEN: But price may be very important in that preselection process.

MR. WEATHERSBY: It may be; and that raises the question of whether information on price should not be made available much sooner in the student's high school career.

MR. HUGHES: To what extent is the average young person aware of price and of aid?

MR. WEATHERSBY: It's hard to give a data-based answer to that question. The NLS survey asked high school seniors what they thought college would cost and then asked the same students, in their sophomore year of college, what college had actually cost. The two answers were highly correlated. Since most people apply to a single institution, and end up going there, this is no surprise.

I would guess, however, that most high school students know very little either about the comparative costs of different institutions or about the kinds of aid that might be available to them. The likelihood of their knowing what the net cost of a college will be before they actually apply is very low.

MR. MALLAN: It seems to me that one kind of needed research

would involve looking at the graduating classes of selected high schools, following them over a ten-year period to see where they end up in college, and then correlating their attendance patterns with their personal characteristics (including family background) and with the type of high school they attended. Such a study might reveal a great deal about the preselection process. The pattern may vary from one part of the country to another, and even from one high school to another, but I suspect that if one took a sample of thirty high schools across the country, one might arrive at some hypothesis about who is going where and why.

MR. WEATHERSBY: I think that's true. We don't know much about how changes in price or in aid affect the preselection process, which probably takes place in the seventh or eighth grade, when students or their counselors decide whether the student will be in the college preparatory track. Probably the single most important decision related to college attendance is the tracking decision in junior high school. So the question becomes: What kind of information do parents of seventh- and eighth-graders have about what federal or institutional policy will be five years hence.

MR. FRANCIS: Has any research been done on the correlation between a individual's selection of a postsecondary institution and his/her selection of a home, automobile, or any other kind of consumer product. Is it not possible that common factors--mainly socioeconomic--influence the selection of a home, an automobile, political party affiliation, and educational institution? I would suppose the family background has a lot to do with the preselection process and that the objective characteristics of the institution itself have relatively little to do with it.

MR. WEATHERSBY: I certainly agree with your point that education ought to be viewed as a service, similar to many other services, and that we ought to look at demand for education from that perspective.

MS. COLDREN: Has anyone done research of the effects of a family's

having several college-age children (the "sibling effect") to see if, for instance, the second or third child tends to choose a lower-priced college than the older child chooses?

MR. JACKSON: I don't know of anyone who has done that kind of study, though the data would easily permit such an analysis.

MR. HUGHES: I think we had better move along. I want to thank both George and Greg for their excellent presentation; we'll be getting back to them later.

Our next presenter is Jim Henson, from the Higher Education Research Institute (HERI), who has had to substitute for Sandy Astin at rather short notice.

The Effects of Federal Aid on College Decisions

MR. HENSON: Thank you. The study that I will discuss, directed by Alexander W. Astin, is still in the analytical phase, so the data tables that we will be looking at later are to be regarded as preliminary. More sophisticated analyses should be available shortly.

Study A--one of four studies making up an OE-funded project to assess the impact of federal and state financial aid programs--concentrates on the "demand" side: How federal aid affects college decisions. To assess these effects, a model and appropriate data must be generated to control for other influencing factors.

A primary purpose of some federal assistance programs--whether they involve direct grants, loans, or opportunities for work-study--is to broaden the range of institutional options available to prospective post-secondary students. The federal government must regularly establish adequate funding levels and recommend the elimination or addition of specific support programs. To carry out these functions, it is helpful to know how various programs influence student choice.

Study A is longitudinal, spanning the period from the beginning of the junior year of hign school to college entry. Thus, it provides an

opportunity to estimate the relative impact of various federal alternatives by examining changes in choice behavior over this time-span. At the beginning of the eleventh grade--when students take the preliminary Scholastic Aptitude Test (PSAT)--their institutional preferences are usually highly tentative and subject to change, and they generally have little information about federal and state financial aid programs. Presumably, they have acquired considerably more information by the time they take the college admissions tests (the SAT or the ACT) one year later. Study A will determine whether different financial aid options are associated with significant changes in institutional preference, as indicated by the type of institution in which the students actually enroll, and whether any such changes are associated with student characteristics (racial/ethnic background, sex, socioeconomic level) or with the characteristics of the financial aid programs of various states; the national scope of the study allows an examination of the latter relationship.

Another major purpose of the study is to identify the interaction between student characteristics and the characteristics of the institutions to which these students apply (e.g., admissions characteristics, financial aid policies, amount of tuition). It will also examine the relative importance of various factors in determining whether particular applicants are accepted by an institution (e.g., institutional resources, student financial need, student ability and other characteristics). A related question is how institutions "package" financial aid offers for different students. For instance, how is the proportion of grant or scholarship funds in a package related to the characteristics of a particular student? Do the criteria used in allocating financial aid differ systematically by institutional characteristics such as type of control, admissions policies, size, and financial attributes? A final set of questions concerns the actual enrollment decisions made by individual students, who must weigh offers of financial aid against

other institutional characteristics like location, size, prestige, and so forth. We really want to know how institutional characteristics interact with student attributes to affect final choice.

Ultimately, these questions approach the issue of the competition between the public and private sectors. Most research treats these two sectors as though each were monolithic, without really examining differences among institutions within the two sectors. Using longitudinal HEGIS data, we have grouped institutions in the public sector by level (two-year college, four-year college, university) and institutions in the private sector by selectivity, as determined by the average SAT verbal+ math scores of entering freshmen (highly selective, moderately selective, nonselective). One finding is that, between 1969 and 1975, full-time enrollment increased in all parts of the public sector, but especially the two-year colleges, whereas in the private sector, enrollment declined in the nonselective institutions, remained constant in the moderately selective institutions, and increased substantially in the highly selective institutions. Thus, when we talk about the two "competing" sectors, we should differentiate by selectivity level among the private institutions: Harvard does not compete with Marquette, nor Stanford with Pepperdine, any more than Volkswagens compete with Cadillacs in the automobile industry.

Complexities of the Choice Process

In brief, then, Study A will permit a detailed analysis of the interaction effects of institutional and student characteristics that lead up to the final selection of a particular institution. By assessing the relative importance of financial aid policies on the decision process, we can then develop a procedure for simulating the likely effects of different financial aid programs on the distribution of types of students among types of institutions.

The emphasis in the study is not on specific analytic techniques

for studying the problem but rather on the creation of a data base that will lend itself to a wide range of analytic models. Extensive data are required to analyze college choice decisions adequately. Choosing a college involves a number of sequential steps, each of which must be measured; that is, the student develops a set of preliminary choices, evaluates those choices and from them develops a revised set, submits applications that are reviewed by the institutions, is then notified of acceptance (along with financial aid offers) or rejections, and then makes the final selection. The data collected for Study A can be used to analyze in detail each of these steps in the decision process.

These data are drawn from the merged data files of the PSAT, SAT, and ACT, which together cover from 800,000 to one million students, and from the Cooperative Institutional Research Program (CIRP), which annually surveys about 300,000 entering freshmen. Each of these data files con-contains information on student ability and other characteristics. While the PSAT data are national in scope, covering a substantial proportion of postsecondary-bound eleventh-graders in every state, both the SAT and the ACT data files are seriously biased, with the former being heavily used by four-year institutions in the Northeast, Southeast, and the Far West and the latter being used by institutions in the Midwest and the Southwest, particularly by two-year colleges. Thus either set of data, if used alone, would be limited with respect to region and institutional type. Taken together, however, the two testing programs give very broad coverage of college-bound seniors across the nation. Thus, the PSAT data cover high school juniors, the SAT and ACT data cover high school seniors, and the CIRP data cover entering college freshmen, enabling us to look at choice over three time intervals: from the eleventh to the twelfth grade, from twelfth grade to college entry, and from eleventh grade to college entry.

Most studies of demand oversimplify the choice process, emphasizing fiscal variables but neglecting student, institutional, and other

environmental characteristics. The principal problem with these studies is not lack of imagination on the part of researchers, who have in fact been very creative in using a limited set of data to construct their decision models. The problem is that the data are just too limited to characterize the choice process with any accuracy.

Study A has attempted to correct this deficiency by creating extremely complex longitudinal data files which include measurement of all the variables that might reasonably be expected to influence the college choice process. Moreover, because of the large sample sizes, the files permit sophisticated analyses of interaction effects. In addition to extensive data on student ability, family background, aspirations and plans, and so forth, the files have certain unique features not available in earlier studies. First, as previously mentioned, they contain data on college choice behavior at three critical points: eleventh grade, twelfth grade, and college entry. Second, each choice is assessed by multiple measures reflecting institutional characteristics that are both psychologically relevant to the prospective student and substantively relevant to policy concerns. Particular emphasis is given to the quality or the selectivity of the college chosen since--as mentioned before--this characteristics is closely related to enrollment patterns, given the tuition gap between private and public institutions.

A third special feature of the study is the set of data that were used to characterize what we called the "local higher education environment" (see Table 8). Twelve variables were used to describe the higher education environment in which each student lives. Thus, for each of the 700,000 students in the eleventh-grade--twelfth-grade file and for each of the 175,000 students in the twelfth-grade--college-entry file, we have measures for each of the twelve variables listed on the chart. Thus, we can tell (for example) how close the nearest public two-year college, the nearest public four-year college, the nearest low-selec-

tivity public university, and so forth, are to a given student's home. We can also tell how many colleges of a given type (for instance, highly selective private colleges, low-selectivity Catholic colleges) are located within a 25-mile radius of the student's home. Note that the distance scale has been truncated at the high end; if the nearest public two-year college was located 1,500 miles from the student's home, this distance is shown at 999 miles. Note also that, in addition to the selectivity measure (which represents the average SAT verbal + math scores for all freshmen entering a given institution), we have introduced a prestige measure, which is simply a combination of a college's selectivity and its size. An institution is characterized as having high prestige if it is very large and moderately selective or if it is moderately large and very selective.

Calculating distances required elaborate procedures: We had a data bank of information on some 2,700 institutions, plus a file of 39,000 zip codes, so we used a Defense Department program for estimating distances on a sphere by using zip codes to identify longitude and latitude and then going through a process for estimating distance. We had difficulty deciding exactly what criteria to use here. For instance, we might have chosen to estimate the number of college places available within a given range of a student's home. Instead, we chose the actual miles to particular types of institutions and the number of particular types of institutions within a given range.

In addition, we had to make some difficult decisions about what particular types of institutions to consider: There was a potential danger of including too much information and thus making the measure so complicated that it became meaningless. Thus, we decided to take into account the institution's level, control, and selectivity, as well as whether it was predominantly black or predominantly white and whether it was religiously affiliated or not. Obviously, these two last characteristics--race and religious affiliation of an institution--may make a

difference in choice, depending on the race and religious affiliation of the student.

Preliminary analyses of data from California and Massachusetts suggest that the variables selected account for a substantial amount of the variance in student choice behavior. These two states were chosen for study because they both have very rich educational environments and yet they differ substantially from one another, the former having a very strong public sector, and the latter a very strong private sector.

Since the question under consideration is why particular types of students choose particular types of institutions, Study A examines the joint distribution of student and of institutional characteristics. Such an examination indicates the need for typologies that not only are relevant to policy issues but also reflect known differences in student and institutional characteristics which may interact with one another.

Our typology of students is based on four student characteristics that have particular policy interest: sex, race or ethnicity, income level, and ability level (see Table 9). By performing all analyses separately for each student category, one can assess the effects of certain variables within categories of another variable. Thus, it is possible to assess the effects of sex, income, and ability separately within groups of blacks, of Chicanos, of Asian-Americans, and so forth. Similarly, the effects of sex, race, and ability can be assessed separately for students of different income levels. Such an analyses make it possible to identify potentially important interaction effects between these basic student variables and all other variables.

Our typology of institutions--which attempts to combine student perceptions as to meaningful institutional characteristics and characteristics that are relevant to policy, such as control (public versus private)--comprises sixteen categories (see Table 10). When used as a dependent variable in multiple-group discriminatory analyses, this taxonomy

will enable us to calculate, for any given student, the following:

- Probability of choosing any given institutional type in the twelfth grade
- Probability of applying to any given institutional type
- Probability of matriculating at an institution in each category.

Although this typology reflects certain policy-relevant variables--such as cost and institutional expenditures--we will repeat our analyses using direct measures of several additional variables (considered independently of the cost, selectivity, size, and so forth), drawing on a master file of institutional data (developed earlier at HERI) which contains HEGIS data for the past few years as well as measures of institutional selectivity and other information. Selected items from these institutional files have been merged with the longitudinal student files to provide quantitative descriptions of the following:

- Institutional choice(s) in the eleventh grade
- Institutional choice(s) in the twelfth grade
- Institution entered in fall 1975
- Other most preferred institutions (up to three) applied to.

College-Going Patterns by Ability Level

Since we have just started these analyses, we have as yet no definitive data. What I will present here today, then, are some preliminary results from simple cross-tabulations in which few statistical controls have been applied. Table 11, drawn from the twelfth-grade--college entry file (which contains about 175,000 cases) shows the relation between twelfth-grade choices and institution actually entered for four groups of students, classified by ability level (SAT verbal + math score). The table indicates, first, the percentage of each ability group whose first two twelfth-grade college choices were a public and a private institution; the percentage choosing a private and a public institution; the percentage choosing two public colleges; and the percentage choosing two private colleges.

The proportions in the first two categories (mixed choice) were about the same for all four ability groups. The brighter students were much more likely, however, to name two private institutions, and the less able were much more likely to name two public institutions, as their first two choices. These differences are reflected in the last two columns, which show that higher-ability students are much more likely to enroll in private colleges, and lower-ability students in public institutions. Perhaps the most interesting column of data is that showing the percentage who enroll in their first-choice college: Regardless of ability level, about two in five students end up at their first-choice college. This finding seems to differ from what George Weathersby reported earlier.

Table 12 shows the average distance from home to college for students of different ability levels, by control of college. As would be expected, regardless of their ability level, students travel farther to attend private institutions than to attend public institutions. The highest-ability students, however, travel more than twice as far to their public colleges as the lowest-ability students, and more than 50 percent farther to private colleges. It should be noted that these distances--which were calculated "as the crow flies" over a sphere--are probably underestimates, since all distances over 1,000 miles were truncated to 999 miles in order to reduce the effects of extreme distances. Thus, a student who goes from California to Harvard or any other institution on the East Coast is shown as traveling 999 miles from home to school.

Tables 13 through 16 represent an attempt to estimate the relative impact on a student's college choice of two variables: relative cost and relative distance. Table 3 applies only to students naming public colleges as their first and second choice, a negative value means that the second-choice institution had higher tuition and fees or was a greater distance from the student's home than was the first-choice college. A positive sign means the reverse.

Thus, among students at the highest ability level (SAT verbal + math scores of 1,200 or more), the likelihood of enrolling at the first-choice college was greater if it was relatively cheaper. For students at other (lower) ability levels, however, the differences were either trivial or in the opposite direction from expectation.

When it comes to relative distance, however, the bias toward the closer of the two colleges is clear-cut; that is, students tend to enroll at their first-choice college when it is nearer and not to enroll when it is farther from home. In short, the distance of the institution from the student's home is more important that its relative cost in those cases where a student's choice is between two public institutions. The caveat to bear in mind here is that we are looking just at tuition and fees, not at other elements that make up net cost. If one were to take into consideration the financial aid that students at various ability levels receive, then one would probably come up with different behavior patterns.

MR. MCPHERSON: In reference to Table 13, were all these students accepted at their first-choice college?

MR. HENSON: No, they were not. The first and second choices referred to in Tables 13 through 16 are the preferences stated by these students in the twelfth grade. Information on the college enrolled in comes from the freshman data. A student is regarded as going to his/her first-choice college if the institution of enrollment is the same as the stated twelfth-grade preference. Those who did not enter the first-choice college may have failed to do so for several reasons. They may never have applied to the institution. They may have applied but been turned down by their first-choice institution. Or they may have been accepted but decided to go to another institution.

MS. DIETRICH: With respect to the various ability levels, are these all SAT scores, or have some been converted from ACT scores?

MR. HENSON: The latter. All institutions are represented here. All the students in our files either have an SAT score or an SAT equivalent, converted from the ACT score.

MR. CORWIN: Are these data for California and Massachusetts?

MR. HENSON: No, these data are for the national sample.

MR. FRANCIS: Did you take into account the difference between resident and nonresident tuitions?

MR. HENSON: In these preliminary analyses, we looked at resident tuitions only.

MR. MALLAN: Did you consider whether the student would be living at home or at the college?

MR. HENSON: That information is in our files, but it has not been used in these preliminary analyses. The only cost factor taken into consideration here is tuition and fees.

MR. HUGHES: Did you exclude from these analyses students who named only one preference in the twelfth grade.

MR. HENSON: Yes. Of the 175,000 students covered here, approximately 40,000 did not name two or more choices. They were excluded from these analyses.

Turning to Table 14 we find a similar analysis for students whose first two institutional choices were both private colleges. Again, distance is clearly related to enrollment in the first-choice college. That is, students are more likely to enroll in their first-choice college if it is closer to home than is their second-choice institution.

College choice reflects a lot more than cost. The analyses reported in these tables used only a few variables: the student's ability level and the institution's tuition and fees plus its distance from the student's home. While miles from home is a partial indication of cost, it

is also related to other factors such as the student's desire to be near family and friends. Moreover, the miles a student is willing to travel is not independent of the tuition and fees he or she is willing to pay. So we need to know more about the correlates of the chosen institution's "distance from home." Nonetheless, when all other relevant factors are controlled for, the variable "distance from home" will probably still be strongly related to college choice.

Turning again to Table 14, we find that the enrollment behavior of students in the top two ability levels is not affected by price differentials between their first-choice and second-choice institution. This does not hold true for students in the bottom two ability levels: They are more likely to enroll in their first-choice college if it is cheaper than their second-choice college. It is tempting to interpret this finding as a clear reflection of how price differential affects behavior. But other interpretations are possible. For example, earlier studies have shown that, in the private sector, an institution's tuition is significantly and positively correlated with its selectivity. It is possible, then, that price differential is simply a surrogate measure for differences in selectivity. That is, since the relation between entry to the first-choice college and price differential operates only for lower-ability students, it follows that such a student is less likely to be accepted at his or her first-choice institution if it is more selective in its admissions policies than is the second-choice institution. This ambiguity highlights the need for more sophisticated multivariate analyses that control simultaneously for a number of factors, including selectivity.

MR. MUNDEL: Could you read through the first two lines in Table 14 and interpret them for us.

MR. HENSON: Yes. Among students of the highest ability level who named private institutions as their first and second choices and who

attended their first-choice institution, tuition and fees at the first-choice institution were an average of $19 higher than tuition and fees at the second-choice institution. The same differential was found among those highly able students who did not attend their first-choice institutions. That is, tuition and fees at the first-choice institution averaged $19 higher than tuition and fees at the second-choice institution. (It is important to note here that those who did not enter their first-choice institution were not necessarily attending the second-choice institution; they may have enrolled at some other institution entirely.) Looking at the final column, we find that for those high-ability students attending their first-choice institution, the institution was thirty-three miles closer to their homes than was the second-choice institution; for those highly able students not attending their first-choice institution, that institution was twenty-seven miles further away than was their second-choice institution. Indeed, the direction of the difference is the same for students at all ability levels. For those students attending their first-choice institution, the sign for the mean difference between first and second choices is always negative, meaning that the first-choice institution was closer than the second choice; for those not attending their first-choice institution, the sign was always positive, meaning the first-choice institution was farther away than the second choice.

MR. FROOMKIN: I take it that these are distances as the crow flies. Actually, the distance of going by car or train might be somewhat different. The real problem is, to what extent do these standard errors exceed relatively small distances: twenty or thirty or fifty miles?

MR. HENSON: Presumably, the errors are not large enough to damage the estimate. Distance is not significant when a student is going to travel ten miles to an institution versus fifteen miles on a particular freeway system.

We are recoding many of these variables so that they reflect the situation of the commuter versus that of the noncommuting student. So

distance will not always be included as a variable, and it may have to be broken out for those who have to travel a long distance versus those within easy distance of their homes.

MR. FROOMKIN: I hope that the analyses will differentiate between those living at home and those living at school.

MR. HENSON: Yes, that variable is included. I will not spend time going over Tables 15 and 16 in detail except to repeat that the tables here represent only preliminary analyses. Thank you.

MR. HUGHES: Thank you, Jim. I think it would be advisable to postpone all questions until after the next presentation and the critiques. We'll move along now to George Nolfi and Valerie Nelson, both of University Consultants, Inc., Cambridge, Massachusetts.

Supply and Demand in Postsecondary Education

MR. NOLFI: This presentation is a preliminary report about some research in progress on the demand for and the supply of postsecondary education. The conclusions are tentative since the study is not yet complete. I will present the first part of the report, on the determinants of demand for postsecondary education, with particular reference to the effect of financial variables and the availability of noncollegiate postsecondary education alternatives. Valerie Nelson will present the second part, on the supply side of the picture.

This research was performed under contract with the National Center for Education Statistics, the Office of the Assistant Secretary of Education, and the Department of Health, Education, and Welfare. I would also like to acknowledge the contributions of three other members of the project team: Charles Manski (Associate Professor, Carnegie-Mellon University), David Wise (Associate Professor, John F. Kennedy School of Government, Harvard University), and Winship Fuller. The first two are also Consulting Associates of University Consultants, Inc., and the last is an Associate as well as the Assistant Study Director.

Over the past several months, we have been looking from two different perspectives at some of the problems underlying the issue of demand for postsecondary education. The first perspective involves the analysis of student decisions or choices; the second is the analysis of institutional behavior and the characteristics of the particular market equilibrium that occurs between institutions and students--what Valerie has termed the two-price market. Fundamental to our approach is the notion that the analytic techniques developed thus far have not been precise enough to get at subtle effects.

People are always complaining that analytic models of demand are not useful in analyzing a particular policy problem at a given point in time: for instance, the public-private issue and declining enrollments, which are currently topics of interest. The reason is that, in developing models, analysts make certain assumptions in light of the issues of that particular time and of the data available; five years later, different issues have emerged, and the model no longer answers current needs. This approach is rational, given limited resources, but not as forward-looking as it should be.

Our approach, then, has been to develop the conceptual structure and to devise some analytic methodology for getting at this structure. While building upon work done previously, we have consciously tried to make a significant step forward. It is this approach that I will talk about today, because we do not yet have a series of policy simulations to lay before you.

Also fundamental to our approach is the notion that one cannot look at just a single decision--for example, the decision to attend college or the choice of a particular institution--but rather must look at the much broader range of options that confront prospective students. We have used two classification schemes, the first involving thirty-one choice categories, and the other, thirty-two choice categories. The main difference lies in the specification of the vocational options and the

postsecondary levels for those choices; we treat the work option in different ways as well.

The tuition differential issue, which is the focus of this seminar, exists because this nation has chosen a massive and highly specific strategy of aiding one certain type of institution: namely, public providers of education. What the project team has tried to do, from the two perspectives, is to look first at how students respond to this factual situation and to the price differences that result, and second (and also very important), to look at the considerable differences in how public and private institutions respond to the different set of environmental factors which they face. Our approach--built upon the earlier work of Kohn, Manski, and Mundel--uses conditional logit analysis to predict not some kind of "average" behavior, but rather the probability of the individual student's attending a particular type of institution (or taking a job or whatever). The power of this approach becomes very great when one looks at specific policies. This is the point that we have now reached. I can't say too much about our specific results, but I can give you some very tentative conclusions.

Features of the Model

First, I want to say something about the ways in which this demand analysis represents an expansion over previous demand analyses. I have already mentioned the significant expansion of the choice data and the choice categories. We feel that this is important for several reasons. As an example, a person's perception of the local wage rate will affect that person's college attendance decision and choice among various institutions. Another important consideration, as evidenced by some of the data presented earlier, is the availability of a low-cost public institution. Even though the student may not apply to such an institution, the fact remains that the institution is in the choice set and should be included when one analyzes student behavior. That these institutions are, in a sense, at the back of the prospective student's mind is indicated

by the fact that a large number of people choose later to attend them. In addition, vocational education options have not previously been included in the postsecondary-level choice set, yet obviously a number of students choose such options.

Our analysis included estimates of financial aid broken down by program type: four-year college, two-year college, vocational school, and so on. The effect of local labor market conditions is analyzed through an expected wage rate. We can also look at the effect of peer groups, which the other presentations this morning have mentioned as an important factor.

The following statements are tentative, but I believe that they will be confirmed by our subsequent work. We have found that such factors as academic ability, SAT scores, distance of college, and so forth have the effects that would be expected from other study results. For example, we find that an individual is much more likely to choose a college where the average SAT score is close to his own than one where the average SAT is very different. We find that distance has a negative effect on the individual's probability of choosing a specific option. There is nothing particularly new in either of these conclusions.

A very important conclusion (and one that runs contrary to what was said in earlier presentations) is that the student enrollments are much more responsive both the presence and the level of financial aid than to changes in tuition. This finding suggests that a financial-aid strategy may be much more effective than a low-tuition strategy in enhancing access. Bear in mind now that I am talking from just the first of the two perspectives mentioned earlier: namely, the effects of various factors on student decisions to attend college, in view of their other options, and on their choice of an institution. Valerie will have more to say on this point when she talks about the institutional aspects; some of her conclusions are drawn from this project, and some come from her own research, which she is publishing independently.

With respect to financial aid factors, we find that, while an increase in aid has a greater effect than a comparable decrease in amount of tuition, the magnitude of that effect differs for high-income and for low-income groups. This finding--which is an excellent example of why efforts should be expended on increasing the sophistication of these analyses to get at different kinds of effects--has important implications for public policy. Each dollar of direct aid has a much greater effect on the probability of attendance among low-income than among high-income individuals. For programs which are longer than twelve months, tuition has no discernible effect on the high-income person's probability of attendance, but it has a significant negative effect on the low-income person's probability of attendance. I cannot at this point give you results which indicate how much greater an effect it has on low-income than on high-income people, or how much greater an effect the dollar of financial aid has than the dollar of tuition reduction. But the direction of these differences is clear, and we will eventually be able to give some numbers that indicate the magnitude of that effect.

According to many observers, policies that consider only financial dimensions are a very limited way of dealing with the access issue. Indeed, research studies done by William Epstein and Richard Freeman show that personal characteristics are just as important--and in some cases, even more important--than financial considerations. Nevertheless, one of our conclusions is that, given the kinds of behavior that can be affected by financial policies, financial aid is probably an efficient way of increasing access and choice in postsecondary education.

I will stop there and let Valerie tell you something about the second perspective, as derived from our work and from her own research.

MS. NELSON: Although I have no specific research or policy conclusions about higher education per se, I would like to raise some questions

that come to my mind about what kinds of research should be done relating to the tuition differential.

The Two-Price Market

First, I view the tuition differential between the public and private sectors of higher education as one example of a more general phenomenon which I call a two-price market in social services. I believe that much can be learned about higher education by comparing it with other service sections such as health care or day care.

Second, I am glad Mr. Francis brought up the question of whether we should look at higher education as in some sense a marketplace. I think that we should, and I will briefly describe how a two-price market operates and discuss some of the conditions one should look for with respect to higher education.

Third, I know that the topic for this seminar is the impact of the tuition differential on student enrollment decisions. I would like to suggest that one must also look at the institutional responses of colleges in the public and the private sector to that tuition differential.

Finally, most of my work in the last several years has been in the area of public and private vocational schools, and my examples will be drawn from this area. In the next year, we will be looking in detail at the collegiate sector as well.

Getting back to the concept of a two-price market--high-priced private options and low- or zero-priced public options, side by side--let me suggest that this phenomenon has become fairly common in recent years. The basic thrust of most Great Society legislation in the mid-1960s was to give federal money to public and nonprofit agencies to provide social services across the country. These services included not just higher education but day care, vocational education, neighborhood health centers, OEO centers, and so forth.

These programs of institutional aid had two objectives. The first was to give disadvantaged and lower-income groups greater access to social services. In higher education, this obviously has been a historical objective of subsidies to public colleges: to charge low tuition in order to make college accessible to low-income groups who cannot afford to pay the full price of public institutions. The second objective of federal aid to institutions has been to improve the range and quality of social services in general, to encourage experimental programs, and to stimulate greater investment in the quality of social services.

The federal government's strategy was not to develop and operate these agencies itself but rather to give money to state, nonprofit, and local agencies which, in turn, would offer the social services at a lower price than would the private market in the local community. Again, as in higher education, the low price was designed to be an incentive for consumption and to give low-income people access to a particular kind of service for the first time. Often, the agencies were specifically targeted on low-income or ghetto neighborhoods.

Much of this institutional aid, however, has one peculiar characteristic: It went to some public and nonprofit agencies but not to others. In vocational education, for instance, money went to state and local public school systems and to community colleges but not to profit-making proprietary schools. In higher education at the state level, much the same thing has happened: Operating subsidies have been given to public colleges and universities but not to the private institutions within the states.

As a result of this strategy of selective aid, a two-price market is created: on the one hand, a set of public institutions that receive operating subsidies from the government and offer a low charge--tuition, in the case of colleges--to the consumer; on the other hand, an array of private institutions or agencies forced to charge the full cost of providing that service to the community.

The question I want to raise is: What happens if one creates a two-price market of this sort? The consumer faces a choice: a low-priced public agency on the one hand, and a high-priced private agency on the other. If one assumes that a new public agency entering this market offers a product identical to that provided by the private agency, then it follows that any rational consumer, seeing two similar agencies--one with a low price and the other with a high price--would prefer the low-priced agency. For example, if a new public college opens in a local area and if its offering are identical to those of a private college in the same area, everyone will prefer to go to the public college.

As a result, there will be a tremendous shifting in any marketplace of this sort, from the purchasing of services in the private market over to the new option. If the amount of resources that can go into the public agency is limited, some way of taking care of the high level of demand for services in the public agency will have to be developed.

One way to deal with excess demand is through rationing procedures: You pick and choose whom to let in. If the agency acts in a manner consistent with the legislative intent of most federal subsidy programs, it will let in low-income people and exclude middle-income people. But the problem is that many institutions, for their own reasons, prefer to admit middle-income consumers. These reasons may be political: For instance, suburban areas have more political power than does the inner city and so are more likely to get federal aid for vocational education directed to them. Or it may be that vocational education schools perceive that middle-income and higher-income students are easier to teach and thus more desirable as students.

One good question to ask about any market such as higher education which receives a public subsidy is, Do public institutions serve the people for which they were intended?

A second question is, Do the new public institutions drive private

agencies out of business without adding to total capacity in the marketplace? If public agencies do not serve the people for which they were intended--i.e., primarily low-income groups--then each student they admit may actually be one student drawn away from the preexisting private sector. In vocational education, the data seem to show that, after 1963, when federal money started going to public schools, proprietary schools lost half of their student enrollment to the expanding public system. Some of the data about higher education suggest that, similarly, some private colleges have lost students to the expanding public system, particularly the community colleges. In essence, new public programs may be drawing only a few new students into the system: that is, people who would otherwise not have attended at all. The only substantial change seems to be the shift from private to public institutions.

The third question is a little more complicated in economic terms. How do the public and private agencies themselves respond to the fact that a price differential exists and that the public agency, at least initially, has a tremendous excess demand of people who much prefer it over the private agency. (Again, the assumption is that the only difference between the two agencies is their price; all other characteristics are identical.) The answer is that the public agency discovers that it can alter its characteristics in a variety of ways and still attract students. Therefore, it is likely that offerings of the public and of the private agency will diverge.

This can happen in three different ways. First, the public agency can simply deteriorate in quality. But as long as the price is low, many students will still want to come to the public agency. A market equilibrium can be reached where the public agency is utilized just at capacity. Below that point, quality can deteriorate to the point that the public agency can no longer get a sufficient number of students to fill its seats. Nevertheless, there is a substantial range in which the public agency can be of lower quality than the privage agency and still attract consumers.

The second possibility is that the public agency will offer something which the consumer doesn't like and isn't willing to pay for, but the Congress is willing to subsidize. In the case of vocational education, an example is the liberal arts courses offered by public vocational education institutions, which students are unwilling to pay for in the proprietary section. In other words, someone has decided that the social benefits of a liberal arts program make it worth putting public money into, but the evidence is that students will not pay for such a program on their own.

A third possibility is that the bureaucrats in the public agency will have different views than the consumer about what the service should be, and they will begin to offer services different from what the consumer is willing to pay for. In vocational education, for instance, the educators may decide that stucents should learn through academic methods, while the students may prefer on-hand experiential learning. Or teachers may decide that students should be in school for twelve months, while students would prefer a nine-month schedule. Teachers may decide that students should be in class from 9:00 to 5:00, while students would prefer to go at night or on weekends. As long as the public agency has the subsidy and the low market price, however, it can still attract students who might prefer different programs.

Price-Value Tradeoff

I call this phenomenon a price-value tradeoff. If the market is in equilibrium, the marginal consumer faces what is essentially a tradeoff of price and value in his choice of a public or a private institution. On the one hand, the consumer has the option of a public agency which does not offer exactly what he/she wants but which does have the low price. On the other hand is the private agency whose offerings reflect much more closely the consumer's preferences but which has a high price.

Several points can be made about this kind of equilibrium point, in a public service sector. First, if the public subsidy were given directly

to the consumer rather than to the institution, the consumer on the margin would choose the private over the public agency. If the price differential between public and private agencies disappeared, enrollments would shift back into the private sector.

Second, if nothing about the public agency confers extra social benefits, then society is spending more money to draw people to the public agency than those people are saying, through their market choices, it is worth to them. In the case of vocational education, for example, a price-value tradeoff tends to arise between direct tuition and indirect forgone income in the following way: Students can go to a low-tuition public vocational school whose program averages four or five months longer than the program offered by proprietary school. Thus, they suffer a forgone income loss amounting to several thousand dollars. On the other hand, the private school is higher-priced but offers a program that is four or five months shorter. To the individual student, the options may be comparable in that the cost of tuition and of forgone income are about the same: roughly $5,000. The individual has the choice of paying indirectly to the public school (through forgone income) or directly to the private school.

What implications does this have with respect to social costs and benefits? If one considers the public subsidy involved in putting one student through the public system, the choices are very different. It costs society something like $10,000 to send a student through a public program, compared with only $5,000 for a proprietary school. In short, we may have a situation where public money is being spent to offer consumers a set of choices to which they are relatively indifferent. Unless the public programs confer offsetting social benefits, this expenditure constitutes a tremendous waste of social resources.

In higher education, this kind of simple two-price market model would lead me to raise the following questions: If the underlying rationale for spending public money is to increase access for low-income

groups, does the empirical evidence show that this purpose is actually being achieved? Second, if it is not, and if many students who might otherwise go to private schools are now entering the public system, are we simply displacing the private sector without adding to capacity? Finally, is there some kind of price-value tradeoff in higher education whereby students at high school graduation face what they perceive to be a range of options varying by price and institutional characteristics? Is there an equilibrium in this marketplace such that, while public colleges have low tuition, they also are perceived by students as having low value, so that if students rather than institutions were given subsidies, they would probably switch to the private colleges?

One way to approach these questions is to differentiate the influence of tuition from the influence of other institutional factors on student decisions. One important question is, Do public and private colleges differ systematically in ways that make the private program the more preferable to the student who is nonetheless attracted by the low public tuition? The policy implications are obvious. If such differences exist, it might be better to give aid directly to students; they would perceive more value from that kind of choice. In addition, giving aid directly to students would create greater competitive market pressures on public schools.

MR. HUGHES: Very good. We will hear next from our two critiquers, Joseph Froomkin and Michael McPherson. I want to thank both of them for agreeing to make their commentaries without really knowing ahead of time what was going to be said.

MR. FROOMKIN: Thank you. Since I came here relatively unprepared, I want to start by venting a number of my prejudices and discussing the presentations in light of these prejudices.

Shortcomings of Models and Data Bases

The first relates to the nature of models of higher education. Most such models separate full-time from part-time students but fail to explain systematically how the decision to attend full- or part-time is made. That failure creates problems in understanding student choices. Granted that most students who enter college immediately after high school graduation attend on a full-time basis and that most of those who delay entry attend on a part-time basis when they do enroll, nonetheless policy-makers need to know more about the reasons for this decision, particularly since part-time attendance has become much more common.

My second observation about the nature of the models is that one should go back to the old-fashioned type of analysis that was widely used at the end of the forties: namely, the type of demand analysis which was called "induced." Perhaps there is some analogy between the higher education market and the car market. One can get transportation out of a Volkswagen or a Chevrolet or a Cadillac, but if one wants to buy a Cadillac, one must pay the full price, whereas one can get a discount on a Chevrolet. Nonetheless, some people still prefer buying Cadillacs. At one time I tried to calculate what I shall call "the Cadillac phenomenon": the extra resources that one gets by paying a premium for higher education. The concept is a most interesting one which is not being followed up; I think it should be.

Some people take the human investment theory at face value, believing that they can become more productive by investing more in themselves if they can get more input. Some idea of ability and input rates might be relevant.

Let me move to my second topic, which I feel very hot under the collar about: the quality of the data base. No one who uses data bases makes clear which cases were thrown out. My agency has looked at the NLS data base and has come up with the horrendous problem of having

either to impute or to throw out a third of the cases. Roughly 9,000 students in the NLS study were supposed to have gone on to college. By the information, roughly 5,000 in George Weathersby's study . . .

MR. JACKSON: That was a random selection, not missing data.

MR. WEATHERSBY: We drew one-third of the NLS sample.

MR. FROOMKIN: Okay, but my point is that the quality of the data base is important. There is some indication that parental income variables are poor and other socioeconomic variables are better. So that is one of the reasons why you may be getting more reliable findings from your study.

Another point to consider is, What data should the researcher collect? A reanalysis of the 1973 tape of the Census Bureau produced some interesting findings. For example, 10 percent of the budgets of the students allowed zero for living costs; 10 percent allowed less than $500 for living costs. What worries me is that perceived costs and imputed costs are going to differ. And even if the imputed costs are correct, the way in which these costs are financed may vary for different families. My son is much less reluctant to spend one thousand dollars of my money than one hundred dollars of his own money. These are some of the old questions that I think ought to be addressed. What we are trying to do in my shop is to go through the 1973 Census tape and build a number of consumption functions, which may be a way out: The decision to spend X amount of dollars for higher education probably arises on the basis of some combination of grants, wages from employment, parental contribution, and so forth.

My last point has to do with the private sector's share of all full-time, degree-credit undergraduates, which has not varied much in recent years. Between 1968 and 1975, that share declined from 30 percent to 26 percent.

MR. FRANCIS: Are you including community colleges in those figures?

MR. FROOMKIN: Yes, sir.

MR. FRANCIS: I don't think you are right.

MR. FROOMKIN: The private sector's share of full-time students has not changed a great deal. Most of the growth in the public sector is attributable to the increase in part-time students.

MR. HENSON: According to HEGIS data, full-time enrollment in the public sector increased 32 percent between 1969 and 1975.

MR. FROOMKIN: That is correct. But because full-time enrollments in the public four-year colleges dropped, the private sector's share of full-time enrollments did not decline much.

MR. HENSON: That was not the aggregate picture that we got. The moderate growth in the private sector was accounted for almost entirely by the highly selective institutions; enrollments in low-selectivity private institutions dropped significantly. And the growth in the public sector was phenomenal.

MR. FROOMKIN: That is correct. Let me make one final point. The human investment theory is all very well and good; it generally looks at rates of return for the average student. But in looking at demand, we ought to consider the rate of return for the marginal student (in this case, the part-timer), which is very high--somewhere between 24 and 25 percent. If one wants to adopt the thinking of the Chicago School of Economics and say that everybody's rate of return on an investment in higher education ought to be 25 percent, and that any figure beyond 25 percent represents consumption, then you might be getting somewhere. One of these days, when I have a little time, I would like to make some of those calculations. Thank you.

MR. HUGHES: We will now hear from Mike McPherson.

Effects of Price and Nonprice Characteristics

MR. MCPHERSON: My comments fall into two general categories, both of which connect with the major issues that were raised at the outset of this meeting. The first is the general price situation in higher education. The second has to do with cause and effect; it may be broadly stated as the interrelation between student enrollment decisions and the decisions that colleges make about what their characteristics will be (including what prices they will charge).

With respect to the overall price situation: George Weathersby was the only person who addressed this topic, and I think he did a very good job, highlighting several points that I would like to reiterate. First, the tuition gap is a problem chiefly for higher-income students. Financial aid shrinks the tuition gap for very low-income students; indeed, in some cases, it may make private institutions cheaper than public institutions for these students. Second, independent institutions face increasing cost gaps for higher-income students, in part because of the financial aid game these institutions play with respect to lower-income students. Finally, students do not really know much about the net prices they will have to pay. I believe that all three of these points are highly relevant to policy.

Turning to my second topic: cause-and-effect issues. I believe that this question should be framed more broadly than as simply the impact of tuition charges on student enrollment decisions. I think we should look at the question in terms of the characteristics that colleges choose to have and of the effects of these institutional choices on student enrollment. First, colleges make a lot of decisions about nonprice characteristics. For instance, they decide how much to spend per student, how selective to be, whether to be coeducational or single-sex. From looking at the historical picture, my impression is that changes in student enrollment patterns, especially public-private enroll-

ment patterns, have been strongly influenced by changes in institutional characteristics other than price. The most important historical change has been the broadening in the range of programs offered by public institutions: all the way from very high-quality institutions such as the University of California at Berkeley to the community colleges, which offer a completely new kind of education to a class of students which was largely ignored in the past by both the public and the private sector. To understand past history, one has to look at more than tuition; similarly, to understand the future, one has to include nonprice characteristics in analyzing student demand. The reason that these characteristics are not often included in analytical work is that they are much harder to deal with.

My other major point with respect to cause-and-effect issues is that there are big questions on the demand side as well as on the supply side. For instance, how do institutions respond to changing student behavior and choices? How do they decide whether to charge high or low tuitions, whether to be large or small, selective or nonselective? I know of no studies that analyze these factors systematically; it's not clear to me whether the studies described here will deal with these kinds of questions.

George Weathersby said something about institutional responses. I think that studying those institutional responses is important not only in its own right but also because of the interrelation between institutional and student responses; you cannot estimate one without understanding the other.

MR. HENSON: Let me interject a comment here. The particular study that I described earlier--Study A--is only one of four parts of a total project founded by OE: another phase of the project involves studying the supply question.

Potential Contributions of Studies in Progress

MR. MCPHERSON: Having made those general comments, I will continue

with some comments more directly related to the questions of how tuition charges affect student enrollment behavior.

It seems to me that the studies being described here, which are all in their early stages, will contribute to our knowledge in two basic ways. First, they will refine the models that have been used in the past, not so much by making radical conceptual changes as by developing further the work of Kohn, Manski, Mundel, and others. Second, they are collecting and using better data.

This second contribution--getting more and better data--is very important. Earlier studies were handicapped by being based on data from only a few states. In many cases, no information on student aid was included. Either student aid offers were imputed to students by some kind of guesswork, or student aid was ignored entirely, and the prices used were gross rather than net prices--a procedure which leads to great difficulties. I think we can expect considerable improvement as a result of the better data.

Nonetheless, our ignorance is not total. Much is already known about the general effects of price on enrollment. Let me enumerate some of the known facts.

First, price changes seem to have some impact on access, on whether students go to college. This has been shown by a variety of studies using different methodologies. The effects are significant, but they are not very large. That is important to remember.

Second, many studies show that price has a greater effect on lower-income than on higher-income students. That finding is very important from a policy standpoint, since it implies that student aid directed at low-income students will be more effective in generating enrollments than will across-the-board cuts or attempts to keep tuition from increasing.

Third (and this point is more tenuous), the overall price differences between public and private institutions, and overall changes in those price differences, have a significant but only moderate impact on enrollment decisions. In other words, any change in the tuition gap will affect the relative proportions of students in the two sectors. But historically, such changes have not been the dominant factor, and they are not so quantitatively important that all our policy attention should be focused on them. One reason I am uncertain about the validity of this last point is that very few studies have taken seriously the issue of heterogeneity and the quality of education in both sectors. I gather that the HERI study described by Jim Henson takes cognizance of this omission and tries to correct it. It is possible (as Henson's evidence suggests) that the tuition gap has a more deleterious effect on private colleges of low selectivity (what Astin in an earlier book referred to as "the invisible colleges") than on the highly selective private institutions such as Harvard.

Finally, I think that the studies described here are going to add significantly to what we know about the effects of student aid; in fact, Weathersby's studies (which is a little further along than the others) has already contributed significantly to our understanding. In the past, most studies simply assumed that the effects of student aid on enrollment or choice of an institution were the same as the effect of tuition: that is, tuition price effects were equated with aid effects. Some studies were based on survey techniques, whereby the college student receiving financial aid was simply asked what he would have done had he not received the aid. Economists are notoriously skeptical of the answers that people give to questions of that sort. We believe that most people don't really know how they would have behaved in a different situation. For instance, I suspect the college student believes that the person asking that question is the same person who is giving the aid, and thus gives a biased response. I have never felt that those surveys were to be trusted very much.

Weathersby's findings, however, establish that aid matters, and that it matters more to low-income students than to higher-income students. For instance, from my reading of Table 5, it looks as if the offer of aid is about twice as important to low-SES students as to middle-SES students, and about seven times as important to low-SES students as to high-SES students. These differences are important since they suggest that aid offers can be targeted on groups that will probably respond to them. Presumably one such group comprises students from low-income families. If so, I question one of George Weathersby's suggestions: namely, that spreading aid around to more people is preferable to giving considerable amounts of aid to a smaller group of people, on the grounds that it is the fact of being given aid rather than the amount of aid that matters. It seems to me that if spreading aid around more extensively means giving it to less responsive people--i.e., those from middle- or upper-income groups--then that approach may not be good. It would be helpful to know more about exactly which groups are responsive to financial aid.

MR. WEATHERSBY: Let me clarify that point. Of the students who are technically eligible for aid, only about 50 percent actually take advantage of it. Some people have argued that those who now get aid are not getting enough and that more funds should go to these students. I am suggesting that it would be wiser to spend dollars and energy on getting into the program the 50 percent who are eligible but do not now receive aid.

MR. MCPHERSON: I am much more sympathetic with that point of view than with the idea of extending eligibility upward.

MR. HUGHES: We have about 15 minutes before lunch, and I think that time should be spent giving the presenters a chance to respond more fully to the critiques.

Some Methodological Considerations

MR. WEATHERSBY: I have four quick comments to make. The first has to do with Joe Froomkin's question about the quality of the data base. To my recollection, missing data were not a major problem in our sample; some imputations had to be made, but they were not the massive problem indicated by the critique.

MR. JACKSON: I think that the important point here is not whether there are missing data, but rather whether there are systematic differences between those people who responded to an item and those who did not. We have tested for such response bias and found none.

MR. WEATHERSBY: My second comment has to do with representativeness, in connection with Jim Henson's reporting. If I understand his statistics correctly, of the 175,000 cases in the twelfth-grade--college-entry file, 40,000 indicated only one college choice; that means that about 77 percent of the same had two or more options they were considering. I believe that the 23 percent of the students who do not have two or more options are probably more representative. There is a kind of "ivy league" bias that assumes most prospective students apply to seven institutions, get offers from three, and choose to attend one. But that is simply not the way the world works, and we should not build policies around that assumption. So I believe that the issue of representativeness is more pervasive than the issue of accuracy.

MR. HENSON: I agree that the issue is important. A major problem in putting this particular file together was to develop reliable data to measure; we spent a lot of money and time to get as large and as representative a sample as possible.

MR. WEATHERSBY: My third comment has to do with the appropriateness of analysis. I am always in favor of using the simplest form possible to explain as much of what is happening as possible. But then there is also another side of me that enjoys the technical side of

analysis. When one has a simple linear form that correctly identifies 85 percent of the attendance choices of individuals, one is then in a situation of having to show how a more refined, nonlinear analysis would increase the accuracy from 85 percent to something higher. That should really be done. For several years now I have been advocating that analysts should look at a variety of models on the same data base and see which model works best. That generally does not happen, and my suspicion is that it never will.

My fourth comment has to do with nonprice characteristics, which I believe are worth looking at. In our research, we sought to find what institutional characteristics, other than those relating to aid or price, affected the attendance decisions of prospective students. In particular, we looked at those institutions (about one-fourth of the nation's colleges) that are funded under the Developing Institutions Program to see if any of their activities--for instance, program enrichment, student counseling, administrative procedures, changes in the kind and quality of a program--are in any way associated with changes in the choices of prospective students. Our conclusion was that the highest degree awarded by the institution of enrollment was in some cases significant; beyond that, however, very few of the nonprice characteristics seemed to have any impact.

MR. MCPHERSON: I forgot to mention one thing in connection with your presentation. You said that your model can explain 85 percent of the variance or the multiple correlations?

MR. JACKSON: No, I said it correctly predicts 85 percent of the student decisions.

MR. MCPHERSON: Two things bother me about that. One is that one of the variables you are including to arrive at that prediction is an aspiration variable: whether the parents want their child to go to college.

MR. JACKSON: No; whether the child wants to go to college.

MR. MCPHERSON: If you asked a slightly different question--"Do you think you are going to college?"--then you are saying that 85 percent of the time the respondents can predict what they are going to do. I would like then to ask you to predict the respondents' predictions.

MR. JACKSON: In fact, I did try to do that, in the sense of trying to predict their plans. If I ignored the kids' aspirations and looked just at their parents' income and achievements, then I could predict something like 74 percent of the students' decisions.

MR. MCPHERSON: Another important point: Accuracy of prediction will depend upon how much variation there is in the willingness of students to pay for a college education. If some students are paying much lower prices or much higher prices than the average in your sample, then by leaving out prices, you would explain a lower proportion of student decisions. But I suspect that students live in fairly homogeneous environments in that respect; that is, higher education prices don't vary much from one part of the country or from one city to another. So If the environment is changed in important ways--in terms of the higher education options available--then one would have to know what those options were in order to predict student behavior.

MR. JACKSON: Absolutely.

MR. MCPHERSON: So what you are saying is that students' backgrounds vary more than colleges do. That is different from saying that there is less potential for changing what students do than for changing what colleges do.

MR. JACKSON: If you want to talk about what would happen if you interfere with the system, then you have to interfere with the system. We are empiricists. We are talking about what we observe. Anytime we try to generalize beyond that, we are working on hunches.

The Need for Sophisticated Analyses

MR. NOLFI: ' I have two or three comments. First, with respect to

Joe Froomkin's comments about part-time students: In our model, we do specify an option for combining part-time study and part-time work. We have developed and analyzed that issue and are currently looking into it further. Bu I think the point is a more general one, which I would agree with: To get precise and accurate predictions about the impact of the alternative policies under consideration, one needs a more sophisticated type of analysis than has heretofore been available, one that takes into account a much broader range of choices. In our analysis, we were able to examine the choice tradeoffs the student faces in going to a local community college or postsecondary program, going to school part time and working part time, entering employer training courses, and so forth. That is the conceptual structure we tried to put in our effort.

Second, as far as the quality of the data base is concerned, we like everyone else have had some problems with the NLS data; one ends up spending a lot more money trying to make the data work than one had originaliy planned. Nonetheless, a number of problems can be solved in what I regard as a professionally respectable manner through various imputation schemes for certain things. We have done that to some degree, as will be clear from the appendices that we will be publishing with the report.

Third, with respect to the question of conceptual change, we feel that the conceptual approaches taken heretofore have been somewhat artificially constrained, with detrimental results. One thing we have tried to do with our two approaches--and particularly in the work that Valerie discussed--is to construct a new and different type of conceptual framework for looking at the supply side, especially for looking at the effect of the major form of subsidy to postsecondary education: namely, that which comes not in the form of explicit aid but as a general subsidy to certain classes of institutions. In other words, one can look at student choice in the perspective of the world as it now exists, but a new conceptual framework is needed to examine the effects of those

policies which created the world as it now exists: namely, this mixture of public and private institutions that persists as the dominant force on the supply side of the market.

The heavy subsidization of certain classes of institutions has a powerful effect on the supply side of the market. There has been no adequate research which investigates that problem in an adequate conceptual structure.

Valerie has constructed a general model that has been applied to explain the difference between the private postsecondary vocational sector and the community college. We are now trying to apply it to the higher education sector.

MS. NELSON: What you described as a price-nonprice mixture is what I would call a price-value tradeoff. I think it is the wrong approach to say, "Let's look at institutional behavior and predict what an institution will do in terms of some objective function." We don't know what a given institution is trying to maximize. In the past, most efforts that took that approach failed. Our approach is to say, "There is some market pressure on institutions. Let's look at what institutions may be forced to do, regardless of what their objective function is." In particular, the public-private price differential is a very major market factor.

Our approach, in studying vocational education, is to say that public subsidies cause public and private institutions to face different market conditions, and this in turn causes them to do different things, some positive and some negative. This is different than asking whether the proprietary school is trying to maximize something different than the public institutions is trying to maximize--a question that I believe is unanswerable.

We ask, Is there some market equilibrium in which public and proprietary schools can co-exist while offering a different mixture of price-nonprice characteristics? The next question is, If the price dif-

ferential changes, what implications does this have for the mix of price-nonprice characteristics in each sector? For example, we are doing simulations which explicitly include a supply response. If tuition at public colleges is raised, the responses of students can be predicted. But a second function here is that if public tuitions are raised in order to restore a market equilibrium between public and proprietary schools, public institutions will have to shorten their programs if they are to maintain their market share. So then we do that, thus restoring an equilibrium.

Rather than asking what the public institutions (as opposed to the proprietaries) will do, we are saying that there is a market force on these schools and that, by looking at institutional characteristics, we can identify for each sector the combination of price-nonprice characteristics that will be equivalent for the marginal student. And if the price structure changes, we can say what changes are necessary in the nonprice characteristics to maintain the public-private equilibrium.

I am convinced that one cannot ask a question about price-nonprice characteristics for a given institution and come up with any objective function that adequately reflects the complicated bureaucratic structure of institutions. Rather, the approach should be to assume an equilibrium between students, prices, and institutions, and to go on from there.

MR. HUGHES: It's almost lunch time. Jim, would you like to take a few minutes to respond to the critiquers?

Covering All the Variables

MR. HENSON: I'll keep my response very short for the time being. My first point has to do with the reliability of our estimates. We are still in the early stages of our analyses, but a great deal of work has gone into assuring that our measures are reliable. I think we have been successful in generating large samples and constructing imputation pro-

cesses which will be made explicit in the final study.

My second point has to do with the variables in our model. We have tried to include as many price and nonprice factors as possible that might influence the choice process. Our file contains an enormous number of variables. We should be able to experiment with a good many models when we start analyzing the impact of student aid.

I'd like to make one other quick comment. What Valerie calls the price-value tradeoff is commonly referred to as the benefit-cost ratio; that is really how prospective students make decisions. In coming up with a benefit-cost ratio, the students look not only at differences in tuition but also at the balance between the costs and benefits of attending a particular institution. Perhaps a very expensive private institution will offer such high benefits that the prospective student is willing to pay a premium for them. The same is true of a low-selectivity public college. If the ratio of benefits to costs is too low, the prospective student will chose another option.

Moreover, one should not overlook the importance of what is often called the "opportunity cost" or "forgone income," which may be a function of the individual's socioeconomic level. It may be very costly for some people to give up working in order to attend a particular two-year college; such people may have to be given an enormous amount of student aid if the benefit-cost ratio of going to college is to be satisfactory.

One last thing: In talking about access, we usually mean simply matriculation, without reference to the type of institution or the type of person enrolling. We are usually looking at the public sector, which may be expanding at the lower levels and in that sense providing access to the least affluent. I think it is very important, when we talk about how aid affects access, to specify the type of institution a person attends and that person's income level, rather than just looking at the fact that the person is now in the postsecondary system.

MR. HUGHES: We will now break for lunch and reconvene here at 1 o'clock.

AFTERNOON SESSION

MR. HUGHES: This afternoon, we will deal with some of the questions on the agenda that were not discussed this morning and perhaps elicit some new questions. As a way of getting us started, I am going to ask Tom Corwin to raise any questions that he feels need to be addressed.

MR. CORWIN: I have a question that I would like to direct mainly at the researchers. This morning's session gave me a clear impression that, for those students who are not eligible for financial aid, the tuition gap is still very much a reality. Obviously, private institutions are a lot more expensive than public institutions. Further, some of our present student aid policies have the effect of widening that gap, insofar as institutionally funded student aid often comes out of tuition revenues. On the other hand, the picture may be just the opposite for students from the lowest income groups; that is, it may be cheaper for them to go to a high-priced private institution than to a community college.

This represents a reversal of the way most of us think about higher education prices. It is still more usual to think of community colleges as low-cost institutions and private four-year colleges as high-cost when, in reality, the former may cost more than the latter for some students.

Is There A Middle-Income Squeeze?

One point that was not touched on this morning was the case of middle-income students: How have massive federal aid programs affected the tuition gap for them? Is money being taken away from them? Are they being forced to pay more? Such questions loom very large this year because government policy-makers are expressing great concern over the squeeze on the middle class. They may even introduce something like a tuition tax credit, at considerable cost to the Treasury. So I wonder what the data have to tell us about how financial aid affects the tuition gap for these students?

MR. WEATHERSBY: I think that student aid has had some effect, and it may be generally favorable to the extent that federal and some state aid programs have enabled the private institutions to hold their prices down (in terms of gross costs). Among the obvious beneficiaries are those people who do not receive any federal or state aid at all. For instance, in New York, with its Tuition Assistance Plan, the indirect effect of student aid is to narrow the tuition gap even for those who do not receive assistance funds. Other than that, one finding to emerge from the research is that middle-income people are less price-responsive than lower-income people. Sometimes it is hard to determine what the price responsiveness of a particular group is. For instance, I worked on a small project for a community college in Massachusetts, in which I looked at pricing policies and estimated the effect of a $200 increase in tuition. It turned out that, for people with gross incomes of under $7,500, Basic Grants would offset half of such an increase; it would offset a fraction of that increase for students from families up to $15,000, and none for students from families with higher incomes. After multiplying the net price change by price responsiveness, I ended up with an almost flat response rate by income group. Thus, the lowest income group had the lowest net price change, but nonetheless were the most price-responsive, whereas those from upper-income levels, facing the greatest net price changes, were much less price-responsive. There was an equal percentage effect over all groups. That is one way of thinking about it. Because of the federal programs, we have a graduated net price system; thus, the percentage impact of changes in aggregate price just about equalizes out on different income groups. At least, that was the case with the community college.

Trends in College Enrollments

MR. HAINES: I have some data that might be pertinent here: statistics on financial aid, college attendance, and so forth, between 1973-74

and 1975-76. One finding that emerged is that middle- and upper-income students were entering lower-cost institutions in 1975-76 than would have been predicted from the 1973-74 data. Another way of saying this is that in 1975-76, first-time, full-time freshmen from higher income groups were tending to go to lower-cost institutions than their counterparts in the earlier year. That might be taken as evidence of middle-class squeeze.

MR. GLADIEUX: The fall 1976 enrollment data show a real jump in first-time enrollments at private institutions: a 17 percent increase, compared with about a 10 percent increase for the public institutions. That seems to conflict with what you are saying. I thought about this point earlier, when we talked about the data from 1969 to 1975 showing relative decline or slow growth in the private sector as a whole and significant growth in the public sector, especially the two-year colleges. A lot of people use these data to project a situation in the late 1970s in which the community colleges occupy a strong position, whereas private institutions continue to bear the brunt of the overall enrollment decline. But perhaps we are in the midst of a transition period. According to some of the anecdotal and informal information that I am getting, private institutions are now experiencing an upsurge of applications for fall 1977. In the public institutions, applications seem to have stabilized.

Choosing the Right Perspective

MR. MCPHERSON: I want to make a few comments about the tuition gap and about middle-income squeeze. One can look at the question from two different perspectives: The first involves comparing middle-income people with higher- and lower-income people at one particular point in time. The other involves looking at trends over time in the position of middle-income people. Whichever perspective is taken, it seems sensible to look at the tuition gap relative to income levels;

such a comparison gives some sense of the individual's ability to pay tuition. If you make this comparison at a given point in time, it is not surprising to find that the biggest tuition gap confronts people in what I would call the upper-middle-income group (i.e., with incomes of from one-and-a-half times to twice that of the median). Obviously, very high-income people face a tuition gap but have the income to cover it; very low-income people do not face a gap; so the biggest gap is faced by those at the middle-income level. In that sense, there is indeed a middle-income squeeze.

But looking at it from the other perspective, one can ask: Over the long run, has that gap grown relative to median incomes in this country? And to that question, the answer is no. Neither public nor private tuition has risen relative to ability to pay; that is a fact that many people tend to ignore or to disbelieve. The so-called middle-income squeeze is no tighter now than it was twenty years ago; it has always been hard for families to send their children to college. The change lies in people's expectations about what they ought to be able to do. Looking squarely at the issue, one would be hard-put to make a case for giving public money to people above the median on income distribution so that they can send their kids to college. From a public policy standpoint, that money could be used in better ways.

MS. VAN ALSTYNE: Could I make three points about the presumption that relative ability to pay for a college education has remained about the same for middle-income families over the last twenty years? First, the effect of recent inflation is to raise money income into progressively higher income brackets, leaving most families with substantially fewer real resources to pay for college. Second, analysts usually consider family income in relation to tuition for one student; demographically, however, the proportion of families sending more than one child to college at a particular point in time has almost doubled. Third, you

said that the tax structure has not changed substantially over the period; that may be true of the income tax structure, but in this country we now have what might be considered a kind of employment tax--in the form of Social Security--and a very substantial number of families sending their children to college got into their income bracket by having more than one worker in the labor force. That second worker means that the family pay as much as $965 in added employment tax, a sum that cuts severely into the discretionary income available for paying tuition costs.

In addition, some of the major reports--in comparing tuition with median income--have failed to consider that it is the lower-cost public institutions that are experiencing enormous enrollment growth. What is really holding down the cost-income ratio is the growth of the low-cost public sector. If the data are disaggregated sector by sector, one does not necessarily find that ability to pay for college has remained constant. In any event, I think you move too quickly to that conclusion.

MR. HAINES: Both NLS and CIRP data seem to suggest that, taking into account all grants received by students across income levels, the net cost to the student (after parental contribution and grant aid are netted out, and considering only loans and work-study grants) is more or less equal across income levels, up to about $20,000. That finding suggests that if more grant money is to be given, it should not necessarily go to the lowest-income students at this point. On the other hand, I'm not prepared to argue that it should be given to middle-income students either.

MR. MCPHERSON: I would be inclined to include parental contribution as part of the burden that is being felt. Parents are, after all, among the major payers of tuition. My calculations are based on that fact.

To reply to Dr. Van Alstyne's point: My calculations looked at

the tuition gap relative to disposable income: that is, income after taxes, including Social Security taxes. Over the period from the 1930s to the present, the ratio of the tuition gap to disposable income remained fairly stable, though I can't sort that out into income tax, Social Security taxes, and so forth.

MS. VAN ALSTYNE: But the labor force participation rate of other family members has increased over that period, meaning that a larger share of a family's income is subject to employment taxes.

MR. MCPHERSON: I looked at the average family's disposable income.

MS. VAN ALSTYNE: How many workers were there per family?

MR. MCPHERSON: I am sure that the figure changed over time.

MR. FRANCIS: Another aspect of the question is that inflation has increased all incomes but has also brought people into higher income brackets. When the progressive income tax structure (with a range from 14 percent up to 70 percent) was created, it was based on a median income of, say $6,000 or $8,000. Now the median has moved up to $13,000 or $14,000, so a larger proportion of income goes for taxes relative to expenditures for milk, gas, and so forth.

MR. MCPHERSON: But federal income tax rates have been cut twice in the last fifteen years. Moreover, looking at the figures net of taxes, you get the same picture.

MR. MALLAN: I have a question for Mr. Haines: I am baffled by the assertion that the net cost is about equal for all students from families with incomes of up to $20,000. What kind of grants are you talking about that equalize the cost?

MR. HAINES: I am talking about all nonreturnable grant aid, including veterans benefits, Social Security dependents' benefits, all the Office of Education programs, and so forth. Looking at NLS data and CIRP

data, one get the impression that if you subtract from total cost all such grant aid, as well as the parental contribution, then the loan and work burden has been roughly equalized across income levels.

MR. FRANCIS: But the "average person" doesn't go to college; specific people go to college.

MR. HAINES: That is the big problem with aggregated data. If it were broken down into finer categories, I am sure we would find a lot more variation with respect to the cost-income ratio. Our data are broken out by institutional costs, though not in any detail, and when we get the data tapes from California, we should be able to break it out in more convenient form. In any case, my assertion is true not only for all schools but for different types of schools with different costs: The net price comes out to be fairly equal for students across a wide range of incomes that includes all of the lower class and much of the middle class.

I think that there is a real problem in thinking about student aid as a welfare program for families rather than as a program which gives students a way to escape from the problems of having come from a low-income family. Using cost-benefit analysis, one can include whatever one chooses in the benefit stream, and it still turns out that price matters. Participation rates vary because of price, and the biggest source of variation in net price is the parental contribution. Using the net price framework I have described, one finds significant changes in rates of return across income, associated with the parental contribution. In other words, the cost of college differs for people from different income groups, and that affects participation rates.

I think the Office of Education student aid programs are aimed at giving kids a chance at an expected rate of return that will be the same for the kid from a family with a $6,000 income as for the kid from a family with a $30,000 income. They are trying to affect the distribu-

tion of income in such a way that the future does not simply mirror the past. But that purpose is a lot different from the purpose of a family welfare program, which tries to change the current distribution of income.

MR. FRANCIS: I'd like to bring up a point that I regard as very important. We talk about targeting student aid on the basis of need. But need-based student aid constitutes only a small portion of the total federal and state commitment to higher education. At the federal level, need-based assistance totals about $2.5 billion, and there is probably about $1 billion of state student aid money targeted on the basis of need. In addition, however, anywhere from $15 billion to $18 billion in state subsidies have no need orientation whatsoever, and federal programs such as Veterans Administration and Social Security grants (neither of which is need-based) total about $6 billion. So when we talk about student aid targeted on the basis of need, we are talking about a very small percentage of the government funds that go for higher education. We are worrying about only 10 percent of the picture when we should be worrying about the other 90 percent.

How Can Nonapplicants Be Reached?

MR. HUGHES: I would like to raise a question in connection with one of George Weathersby's tables, Table 2, based on NLS data. It shows that about 43 percent of the 1972 high school seniors actually applied to a college; about 57 percent did not. What information do you have on the aspirations, motivation, and other nonfinancial characteristics of those who do not apply that might suggest how we can develop strategies to reach that group?

MR. WEATHERSBY: The really interesting part of that table is that, of the 57 percent who did not apply, nonetheless slightly over one-fifth actually enrolled in college. On the other hand, of the 43 percent who actually did apply to at least one institution, about one in four ended up not attending any college at all. Ultimately, these two groups--those

that enrolled in college without prior application, and those that applied but never enrolled--just about balance one another out.

Actually I don't have a lot of guidance to offer. The whole question of what role aspirations play and to what degree explicit federal policy affects aspirations is one that we have not explored very thoroughly. People's aspirations--their expressed intention of going on to higher or postsecondary education--have fairly high predictive value. People who apply are admitted. It is hard to find demonstrable evidence that there are a large number of people whose college aspirations remain unsatisfied.

At the same time, postsecondary education remains a minority enterprise. Relatively few high school graduates actually go on to college. Of the 18-24 age group, something like 24 percent are currently enrolled in some form of postsecondary education. Most people in the labor force have not had a college education.

Because we are involved in higher education, we often tend to think that everyone ought to go to college. But I don't believe that is so. I personally have no great desire to get to that 57 percent and say, "You people are missing out on a good thing. You ought to apply." I think we ought to let people know what their options are, how much college will cost, and how postsecondary education might benefit them. But then it ought to be left up to their personal choice. Greg, what are your feelings about it?

MR. JACKSON: I would agree with your position. Ultimately high school graduates will make up their own minds about what they want to do; the federal government should not be applying undue pressure to influence their decisions.

Now, the problem with that statement is that we should also ask what the opposition is doing, the opposition being, perhaps, the movement called Career Education which argues that high school ought to be preparing kids for the world of work so that they can get jobs rather

than a useless college education. Career Education is mainly concerned with telling people what work is like and what jobs are available.

At the same time, I think it is imperative that reasonably accurate information be available to young people so that they can make informed decisions. One kind of information that is not readily available now is information about how much college costs. If people don't want to go to college, they won't go. But they should be given the chance to make an intelligent decision.

Income and Race Differences

MR. HUGHES: But we do know that postsecondary participation rates for lower-income people remain rather stubbornly below the rates for upper-income people. Should we be doing something to equalize the distribution of educational benefits?

MR. JACKSON: One might argue that going to college for four years is basically a kind of leisure activity and that we are really talking about the ability to buy some kind of leisure activity. What you are talking about is income equality, not higher education.

MS. NELSON: I think I can shed some light on that question using findings from a study by William Epstein and Richard Freeman, who analyzed how various high-school-age variables affect the individual's going on to college. What they found was that neither achievement variables (such as academic ability, verbal ability, abstract reasoning ability) nor personality variables had much effect. What did make a difference was parental expectations. That is, the most important predictors were what the child's parents expected of him or her in terms of future schooling and subsequent earnings.

MR. TOLLETT: That finding intrigues me. Recently, I was urging the Project to undertake a study to find out why the achievement of black youth is not more closely related to parental expectations. A

number of studies have indicated that black parents have higher expectations for their children than almost any other segment of our population, except perhaps Jews. Yet blacks are not participating in higher education to the extent that one would expect, and this discrepancy deserves investigation.

For what it's worth, I came up with a hypothesis that might explain the situation: that the child's achievement is correlated with the parents' involvement in the educational process, and even more specifically, with the parents' visiting the school. A few years ago I predicted that the feminist movement would result in a lowering of achievement among middle-class whites, and that seems to be occurring. I have for a long time felt that parental nurturance has a lot to do with the child's performance. But that is a hypothesis, not a proven fact. I come back to my initial point: In view of the high expectations of black parents, why don't more blacks go to college?

MR. KUCH: But the major influence on a young person's decision to go to college seems to be, for whatever reason, family income. My impression is that, when background characteristics (such as family income) are controlled for, the data show that blacks are more likely to go to college than whites are.

MR. TOLLETT: Perhaps what I am stating is my dissatisfaction with the level; I want their participation rates to be higher.

MS. NELSON: Without really trying to answer your question, I would like to lay a few facts on the table. One is that, for most groups, the aspirations of the parents seem to exceed those of the children, insofar as further schooling is concerned. I don't know precisely how the data break down for blacks and whites, but looking at NLS data, we have found that the discrepancy between expectations in high school and actual achievement after high school is greatest for white males. That is, they are the group least likely to realize the aspirations they had

earlier. Females and members of minority groups seem to be far more successful in achieving their aspirations.

MR. JACKSON: When you talk about achieving their aspirations, do you mean going to college?

MS. NELSON: Yes, I am talking about those people who expected to go on to college but who are working instead.

MR. KUCH: The switch works both ways: Some people who expected to be working end up going to college; but more frequently nowadays, those who expected to go to college end up working.

MS. NELSON: The whole question is terribly complicated. Returning to a point that was made earlier, about the increase in enrollments at private institutions: If one accepts some of Richard Freeman's findings about students' being sensitive to expected labor market payoffs, and if one accepts that private institutions are perceived by most students to have a higher value than public institutions, then that increase is in part explained. If one goes one step further and assumes that, for minority groups, the decision to enroll in a particular college may be much more heavily contingent on perceived economic payoff because these groups are more concerned with social mobility, then it may be that minority students are being far more aggressive and more successful and tending to enroll more in private institutions. I'm just sort of spinning ideas out now; are there any data to indicate that this is indeed happening?

MR. TOLLETT: No, I think the data show the contrary: that blacks are much more likely to enroll in community colleges and in state institutions of low selectivity. Their distribution is heavily skewed in that direction.

Other Determining Factors

MR. STAMPEN: We seem to be going back and forth across the table

with vastly different interpretations of the data. I have a few more facts to add. I have just completed a survey of state departments of education inquiring into the college-going rates of the states' high school graduates. So far, we have received returns from twenty-six states which keep such records, and they show that between 1970 and 1976, the proportion of high school graduates going on to four-year colleges (both public and private) decreased. Enrollments in vocational schools generally increased, and the trends for community colleges were mixed.

Another survey of our member institutions indicated that the factor of rural versus urban location may explain the growth or decline of institutions. Up until last year anyway, urban institutions were growing, whereas most rural ones were experiencing enrollment declines. The impression I get from looking at the data for our member institutions is that, over the last six or seven years, higher education participation has shifted downward: that is, the propensity to attend some sort of postsecondary institution has not decreased, but there has been a kind of stepwise reduction in aspirations.

That doesn't quite square with some of what I have heard here today. Can we call student aid a success when it appears that increased college costs have adversely affected attendance behavior, at least the quality of it?

MR. HAINES: May I add something to that? You may be familiar with one study that used SCOPE data from 1961 and NLS data from 1972. As I recall, it showed a shift across socioeconomic groups: That is, the participation rates of all groups had declined somewhat over the period, but that decline was sharpest for the high-ability, middle-SES group. Further, not only were more of these people not going on to college but also, of those who were enrolling in postsecondary education, more were shifting toward the two-year colleges.

MR. KUCH: Just as a quick response, I would say that factors outside the higher education system may be affecting the decisions of young people about whether to go on to college. For instance, student enrollments seem to be responding strongly to changing employment levels in certain occupations. Data suggest that in 1969, the income advantage to a college graduate over a high school graduate was 39 percent, but in 1975, that advantage had dropped to 6 percent. It is that real drop in job opportunities that is leading to decreasing college enrollments.

MR. STAMPEN: The Freeman study has been criticized rather heavily; I think the decline in income advantage was considerably exaggerated.

MR. KUCH: I don't know that.

MR. STAMPEN: As Carol pointed out earlier, several factors have combined to make college more expensive. For one thing, there is greater "sibling overlap": That is, more kids per family are college age. For another, aspirations are higher: That is, more families expect all their children to attend a college of some sort. Finally, you have general inflation, with everyone being pushed up to a higher tax bracket. Basic commodities are becoming more expensive; more money is needed for food, shelter, transportation. It is an unusual situation, and maybe it will all dissipate in a few years. But in the last few years, a number of factors have aggravated the cost-of-college-attendance problem, and enrollment behavior has responded accordingly. That isn't universally recognized.

What Are the Effects of Student Aid?

I have a question about the Weathersby study: How do you come to the conclusion that student aid has increased access in relation to other cost factors?

MR. WEATHERSBY: What one tries to do in this sort of study is to look at the actual decisions people make; though one can't know what is truly causative, one can examine the factors associated with those de-

cisions. One factor that does not appear to be closely associated with those decisions is the range of the total cost of attendance. People consider a range of postsecondary options; they consider a range of financial aid characteristics. Whether an award was made seems to have some significant impact on enrollment decisions. That is how one comes to that kind of conclusion.

Let me add an interpretation here. I don't know if it is true or not, but it might explain the behavior that you are labeling negative. That is, many prospective students may not take the elite private-college view of the world; they may actually believe that community colleges and state institutions are good institutions--which I happen to believe is true. Thus, what you are calling a downward shift with negative implications may actually be viewed in a much more positive light. Perhaps educators are too inclined to define high-cost institutions as good institutions. Being a product of the University of California, I don't accept that definition. I would interpret some of the shifting that you have observed as attributable to increases in the quantity and quality of educational services that are available through other than high-cost options.

MR. KUCH: It may well be that your explanation is valid about the presumed "downward" movement of the high-ability middle-income students. That decline may be associated with better market information. That is, prospective students from that group may be more aware that two-year colleges and certain other public institutions provide more vocationally relevant training, and thus they may be opting for a more profitable investment of their education dollar.

I also have a kind of caveat to add to something that George was saying earlier. His Table 2 shows that, of the NLS sample who applied for college, about 60 percent were in the "single-application" category. That comes from the NLS second survey, first followup. Looking at the

original data base, however, one finds something like 10 percent fewer students in the "single-application" group. So a question arises as to whether one should look at ex-post or ex-ante in terms of applications. On issues of detail like this, when one looks at individual cases, one finds some very interesting differences, some of which are expected and some not. For instance, rural young people tend to be single-application types, whereas urban youth tend to be multiple-application types. This makes sense in that the urban resident probably has better information as well as a greater number of institutions in close proximity. But one finding I did not expect is that something like 66 percent of blacks make multiple applications; that was discovered by looking at developing institutions, predominantly black institutions. One of the rather folksy assumptions is that these schools operate to provide sole access to blacks in the vicinity; therefore, one would expect that black institutions would draw predominantly single-application types. But such is not the case. It's not clear what is going on here, whether black students generally are applying to several institutions. It would be interesting to identify just who the multiple applicants are; then, on that basis, one might determine whose decisions are most likely to be affected by the availability of financial aid.

Another more general methodological issue relates to the effect of tuition versus financial aid. I get the impression that most studies have used separate explanatory variables for these two factors, on the assumption that students mistakenly perceive tuition dollars as somehow different from equivalent aid dollars. Therefore, they are not treated as a single variable. That seems reasonable, but I have some difficulty on the other side. Insofar as there is some relation between level of tuition and amount of aid, it is not possible that some collinearity is being introduced into the system, thereby biasing upward the response with respect to aid and downward the response with respect to tuition? Could this be an issue? Has anyone examined this question?

MR. HAINES: Another problem arises with respect to parental contribution in that it does not vary as neatly as our needs analysis system suggests. As college cost goes up, so does parental contribution; and as grant aid goes up, parental contribution tends to decline at all college levels. Some kind of interaction is going on that needs to be taken into account. I think this is the same sort of thing that Peter was talking about.

The BEOG Impact

MR. GLADIEUX: One development that has not so far been discussed in connection with the effects of student aid--perhaps because it is very recent--is the profound impact of the Basic Educational Opportunity Grant program, which is being fully felt for the first time this year as it reaches all four undergraduate classes. The BEOG program is different from other student aid programs. It is predictable, universal, pervasive; it makes students more aware of their opportunities. It is at the maximum award level now. This fact is not reflected in current studies because the data were not available earlier. For instance, the NLS sample was not so heavily affected by BEOGs because the program was not fully matured at that time.

I think that BEOG has had an effect on recent enrollments. There has been a jump in first-time enrollments, though overall enrollments have stabilized.

MR. HENSON: The file we worked with in our study reflected two years of Basic Grants. The effect of that program, if it is indeed different from that of other programs, should have made itself apparent.

MR. GLADIEUX: The first two years don't mean that much.

MR. HENSON: The magnitude of the expenditure was extremely large.

MR. GLADIEUX: Yes, but the expenditure is now about $2 billion, tenfold what it was initially. Participation was very low in the first

two years; now it is out of sight, and appropriations just aren't keeping up with expenditures.

MR. HENSON: We will soon have the data tapes for 1976, and they should give us a handle on what the effects of BEOGs really are.

MR. GLADIEUX: Just to reinforce a point: Student aid traditionally has been very diffuse, very decentralized; that is one of the reasons why students have not had the information they needed beforehand. We have been talking about the preselection process--what happens early in the game, in the junior high school years and the first years of college, as students look ahead to their postsecondary options. I think that the BEOG program is giving them a better sense that aid is available, that they have to consider more than just tuition or stated price. It is making them more aware of other aid opportunities as well.

MR. WEATHERSBY: It is interesting to note that the Basic Grants program has created a tremendous pressure on the states to raise tuition at the state institutions, up to a total cost of $2,800 plus. Perhaps one impact of BEOGs, for students who are above the eligibility cut-off, is to increase the cost of attending a public institution and thus to reduce the tuition gap to some degree. Whether intended or not, the effect of BEOGs is to generate a new source of revenues for public institutions: namely, student grants. So a cycle develops: The total cost of education is raised by $1,000; then everyone is given a grant that is $1,000 minus BEOGs; in that process, an average of $500 per student goes from the federal government to the institution. You can see this happening. Two out of three of the University of Massachusett's campuses have raised their price, and the third is under pressure to do so. So there has been a dynamic effect which is working against access, because it raises the price for people who don't have financial aid. I don't think that this effect was intended; I don't think that Congress voted to induce the states to raise their prices.

MR. MALLAN: That is information that I have been trying to get. I have been asked several times whether there is a clear causal relation between the growth of student aid and the increase of public tuition. You are referring to Massachusetts: Is there really clear evidence that, when the state was considering raising tuition at the state institutions, they considered the effects of BEOG and other student aid? Is that your impression?

MR. WEATHERSBY: Initially, the state was unwilling to expand its support of public colleges because of fiscal constraints on the state budget. So the question became how to stay level. The other side of the question was, Could students afford to pay more? The answer, in the case of low-income students (whom we were most worried about hurting), was that they were protected by the federal program.

MR. MALLAN: Was that set by the legislature?

MR. WEATHERSBY: The Board of Trustees were responsible for making those decisions. The arguments were presented by the staff to the trustees.

MS. SMITH: Again following up on Larry's point: I hope that some of the studies we are talking about here today will look more closely at the impact of BEOGs. From what we can tell by running the 1976 CIRP tapes, institutions are gradually shifting their campus aid programs to higher-income students. They seem to be trying to provide a little to a lot more students. It may be that student financial aid officers are trying to package aid in such a way as to encourage certain levels of students to attend who might otherwise not do so. The question gets back to what we were talking about earlier: It is the offer of aid by itself or the amount of aid that makes a difference?

MR. HUGHES: Are there any other questions that should be raised at this point? Carol?

What Further Questions Should Be Considered?

MS. VAN ALSTYNE: In the time we have to wrap this up, can I raise some questions as a resident economist? Sitting through what I perceive to be helpful and extremely well-conceived analyses of student aid that have produced a vast amount of useful information, I still end up with some serious reservations about the application of these analyses to public policy decisions. I am profoundly disturbed by the dominance of economics in the analyses, and I want to run through several points that bother me.

First, public policy has been discussed today with no differentiation between federal and state policy. As I understand it, over the last five years the federal government has defined its role as providing access, whereas the state role is defined as providing basic financial support of higher education and providing educational options. In discussing student financial aid, we have looked exclusively at its ability to further access; we have not talked about the state role, and we have not shown that student aid is the only way or the best way, even through improved market responsiveness, of providing educational options. That has been the assertion, but it has not been demonstrated.

My second concern is that the discussion today has treated higher education exclusively as a consumption expenditure, with no clear and articulate distinction between the consumption and the investment aspects of higher education. That has led us to use the word "subsidy" in too loose a fashion. One fairly technical definition of the term "subsidy is a public payment to a private firm or household which is a transfer payment, the principal objective of which is income redistribution; no output is produced in the current period as a result of this subsidy. That is the distinction between a subsidy and, say, the purchase of goods or services by the public or the government. We use "subsidy" as if there were no output resulting from this educational

expenditure. What the student and the parents provide is regarded as private expenditure or contribution; anything else--like a grant or a guaranteed loan--we tend to label a "subsidy." But in home finance, is what the mortgage banker provides the homeowner labeled a subsidy? It is not; it is a mortgage, a way of spreading over time the financing cost of the investment. I would argue that there is a direct analogy, that what we really ought to be looking at is the best way of spreading the cost of this educational investment over time. Then the question becomes, Is it better to do this through a public tax transfer system or through a private loan finance system?

Those who want to shift to high tuition and high aid payments have to take into consideration the availability of loans to, say, middle-income families who must pay for this financing of higher education over time. That brings me to my third point: the adequacy of the loan market for middle-income families. No one here today has dealt with that question.

My fourth point has to do with the equilibrium of education markets. One presentation made here today stated that we have what was labeled a subsidy of public institutions, so that their price remains low. According to this view, the student is faced with a choice between a low-cost, nonresponsive public institution and a high-cost, high-quality private institution. But this explanation does not at all account for what has been happening in the public sector, with the growth of enrollments in two-year colleges. That growth is explained precisely by the responsiveness of the two-year public colleges in meeting market needs, needs which the private sector had decided not to meet. It is not a combination of low price and nonresponsiveness in the public sector that accounts for burgeoning enrollments in the community colleges; it is just the reverse.

Fifth, with respect to the assertion that public agencies dispers-

ing these "subsidies" over time change their clientele through a political process, deflecting the original legislative intent to target assistance, in this case to low-income individuals, I wonder if we are ignoring the economic explanation as to what is going or here. It may be that our perceptions of "ability to pay" are simply inadequate. We look at ability to pay in the context of education as a current consumption expenditure rather than as a long-term investment. If we adopt the latter context, then the term "need" takes on an altogether different meaning for low-income and for middle-income families.

Sixth, skipping over some of the technical points--the price-response coefficients, whether the model should be linear or nonlinear--the fit and the transferability between a linear and a nonlinear model depends very much on the range of variables. Sometimes, in trying to predict what will happen in the future, analysts forecast changes which are really outside the scope of existing analyses. They cannot be sure that their models specify all the factors that will be operating in the future, when the array of opportunities may be vastly different.

Finally, with respect to student responsiveness to tuition and to financial aid: Much has been said about differences by income and by race, but one point that has been overlooked is that middle-income blacks have the lowest educational participation rates of any group, lower than those of whites at all income levels, and lower than those of low-income blacks. It is not clear how need-based aid is going to reach middle-income blacks in order to bring about equal educational opportunity.

MR. HUGHES: Would the assembled economists care to comment on Carol's first point, which had to do with the differences between federal and state policy with respect to student financial aid; is there a clear distinction between federal and state purposes, or should there be?

Federal Versus State Purposes

MR. HAINES: I'm not sure whether economics can determine whether the states ought to be putting more money into higher education than the federal government, or whether the federal government, in its student aid programs, should be more concerned with access and the states with other purposes.

MS. NELSON: About all an economist can do is to specify benefits to the nation versus benefits to the state. Obviously, there is a range of issues relevant to the federal government's getting involved in institutional subsidies if that reduces the autonomy of institutions. There is a long history of revenue sharing and of federal-state relationships outside of higher education that have a bearing here.

MS. VAN ALSTYNE: I question the use of the term "subsidy" to institutions, when it has not been determined whether something is being purchased for that investment.

MR. KUCH: You are wrong on that. You can subsidize the purchase of capital goods, so the term is justified in this context.

MS. VAN ALSTYNE: One can subsidize both consumption and investment. What I am saying is that we automatically use the word "subsidy" without examining its meaning. I am saying that the term should be "public investment in education," to recognize that there is a return on the spending.

MR. HUGHES: It seems to me that federal and state policy converge, at least in the area of student aid, partly through intent and partly through happenstance. For one thing, the federal government is indeed encouraging state scholarship programs. For another--and even more important--the states are now taking cognizance of the very large BEOG program in making their own student aid policies. Thus it becomes more and more meaningful to talk about public policy in terms of both federal and state action.

MR. WEATHERSBY: We tend to argue that the federal government or the state governments should give financial support to individuals who have had the misfortune to be born into poor families, feeling that they hadn't much choice in the matter. But a much greater part of the variation in educational opportunity is accounted for by the fact that some individuals have the misfortune to have parents who don't live in New York. That is, support to students varies more across states than across family incomes. The federal role has legitimated financial support on the basis of family income but not on the basis of state residence. That is particularly interesting since one question involves the relationship between governments, which might presumably be worked out by fifty people sitting around a table, whereas the other involves the relationship between parents, and that would require sixteen million people--presumably somewhat more difficult to work out.

MR. FRANCIS: I would like to raise a question as to why we are worried about the tuition differential between public and private institutions, and I think the answer to that question will determine our approach. If we are worried about it because it means a loss of the private sector, we should be approaching it in one way. But if we are worried about it because it means that a lot of people have to pay more to go to a private school and that a lot of education is being lost if there is something to be offered by the private sector, then we ought to be taking a different approach.

MR. HUGHES: It seems to me that the Weathersby and the Henson analyses have shown that, to a large extent, the price differences are mediated by a number of factors . . .

MR. FRANCIS: I understand the "what is"; I want to know the "why." There is a difference between analyzing what is happening on an ex-post-facto basis and determining why we are worried about the tuition differential in the first place. It exists, and we know it. It has been

studied ex-post-facto for a number of years. The question that should be asked is, What is the purpose of concerning ourselves with the tuition differential, and what should be done with it?

MR. HUGHES: I think that tuition is one of the most important variables in the whole equation of determining who goes where to college. A lot of public policy questions, particularly in relation to student aid, center on tuition. You may be raising a good question, but at the moment, tuition seems to be very much in the picture with respect to cost differences.

Consumption Versus Investment

Who wants to take a crack at responding to Carol's remarks about the consumption versus the investment concept of college education?

MR. HENSON: I think the perspective we had today was that people are making decisions in terms of the benefits they associate with attending a particular type of institution; we have been looking at education as an investment. Dick Francis earlier raised the question, What is it about the tuition gap that bothers us? It seems to me that Valerie's point was that tuition policy may not be the most efficient way to assure high educational participation rates or to allocate educational resources.

MR. HAINES: While I don't basically agree with Carol's view, I think she had a point in talking about this problem. We very definitely think about this subsidy as investment to the extent that we are concerned with the benefits that society may derive. But we haven't really been talking in those terms. We've used the term "subsidy" because we have been concentrating more on the returns to the individual rather than to society, in which case "subsidy" is an appropriate word, and one that comes naturally to me as an economist. Were we talking about the return to society of all this expenditure for education, then the correct term would be "investment. It is largely a semantic problem.

MR. HUGHES: Perhaps it would be appropriate to have a seminar on the economic theory of education as an investment.

MR. FRANCIS: In the two or three years that I have been in this town, I have been told repeatedly that the reason for the enormous government subsidy for education is that education is of prime importance to society. So then I have raised the question, What is of even greater importance to society? Answer: the health of the people. Then I ask, if we are going to establish public colleges and universities and sell the product for a third to a quarter of the actual cost, on the grounds that education is important to society, why then don't we establish public commissaries that sell food at a quarter of the cost? But we don't do that. We subscribe to the principle that the most needy should be subsidized through a food stamp system. We don't set up government commissaries in competition with Safeway and A&P.

Why don't we, then, set up an educational stamp system, make such stamps available to the most needy, and then have all colleges and universities cost-priced? That takes care of the tuition differential problem completely. Everybody will sell their educational product for what it costs them, everybody can buy it on the basis of their ability to purchase, and those who need a subsidy will get it through an educational stamp program. That is a policy question.

MR. HUGHES: Does anybody want to propose a voucher system?

MR. KUCH: My understanding is that current federal policy is to introduce money into the higher education system primarily through the student as opposed to the institution, which is a rough analogue of the voucher system. The problem is that there are certain eligibility criteria and cutoff points that exacerbate the net price differential. The basic pricing structure has really arisen from the state policy of heavily subsidizing the operations of public institutions. So in some sense we can talk about federal policy and state policy having different

thrusts. I gather that there has been some attempt to coordinate these efforts so that the combined financial aid system will whittle away at the differential.

MR. FRANCIS: That is the kind of question we ought to be addressing when we discuss the price differential, rather than worrying so much about ex-post-facto effects on pricing mechanisms.

MR. HUGHES: It seems to me, Dick, that one of the policy questions we are dealing with is the extent to which the federal government and the state governments (insofar as the states have similar problems) have carried out the aim of improving access to the higher education system and enhancing choice within that system. Access for lower-income people has definitely been improved over time.

MR. FRANCIS: But think of what could be done if the $17 billion that the states spend to subsidize the public system of higher education were distributed to students directly on the basis of need. Given the tremendous impact of the $2-4 billion that the federal government distributes on a need basis, imagine the impact that five or ten times that amount would have. You could educate every needy person in the country without any additional problems. This would make more sense than subsidizing the student from a family with a $50,000 income, who attends a public college at three-quarters of the tuition.

MR. HUGHES: I don't think that is the real question at issue.

MR. FRANCIS: It is a policy question.

MR. HUGHES: It is not a policy question in a real sense; it has no connection with what the federal government is likely to do or with what state governments are likely to do.

MR. KUCH: I gather that the thrust of this seminar was intended to be something like this: Granted that the states have created a differential pricing structure, should the federal government so manipulate its

own financial aid operations as to compensate for the price differential? If it does not do so, then the consequence is that some private institutions will disappear. That brings us to the question, So what? That I think is the issue, and we have not made much progress in addressing it.

MR. FRANCIS: The question is also, To what extent should the federal government involve itself in the mechanism of education within a state? To what extent can federal dollars influence this?

MR. KUCH: The federal government could probably remove the price differential entirely, if it chose to do so, but that would probably be highly inefficient. It might be more feasible for the federal government to lean on the states and get them to reduce the level of subsidization to public institutions.

MR. FRANCIS: Some people have proposed just that.

MR. NOLFI: To some extent we are moving in that direction. If in fact the states are responding to the BEOG program by raising tuitions, then one can argue that they are beginning to shift the burden of payment away from the general taxpayer and toward the high-income consumers. It could be argued that such a move is progressive. The next question to arise is: If public institutions are responding to BEOG's subsidization of low-income people by raising their tuitions, is such a move desirable in terms of social equity? At what point does the cutoff come? Do BEOG grants go up to a high enough level so that tuition does not become a factor in the choice to attend or not to attend? Our studies show that for families with incomes above $10,000 (which is the group we call "high-income"), tuition has no effect on decision to attend.

MR. HAINES: George, in this morning's paper, I found a headline stating that the "austerity budget" for a family is above $10,000.

MR. HUGHES: Mike, would you care to comment on Carol's question about whether current economic policy is in effect shifting ability to pay . . .

MS. VAN ALSTYNE: I raised the question of whether ability to pay might be different when one is thinking in terms of investment than it is when one is thinking in terms of consumption.

MR. MCPHERSON: I am speechless. I think that is probably right, that there may be a difference.

MR. WEATHERSBY: Unfortunately, economists have so many obscure terms that it is easy to become confused, but there is a difference between pricing and financing. If a person goes to finance a car, we call it a loan; nobody calls it "car aid." But if a person gets a loan to go to college, that is called "student aid"--which is a fraud.

If one gets a house mortgage at 7 percent interest (because it is guaranteed by the federal government) rather than 9.5 percent interest, then federal policy has lowered the interest rate by 2.5 percent. But that is the issue of setting price and is different from the issue of financing total cost. I think we have confused the two, because we think of anything that happens in a given year as having to do with consumption. There are some states where all the capital outlay budget is paid annually as cash flow; there is no state investment in a formal sense. But we ought to distinguish the pricing of college from the financing of college (that is, from the student's and the family's perspective). I would like to see the financial office of the college--not the financial aid office--be responsible for the financing of college. We should be very clear about price setting. Also, we should bear in mind that if one purchases goods from a manufacturer, one can get various kinds of discounts: quantity discounts, prompt-payment discounts, end-of-roll discounts, and so forth. Higher education has learned from private business how to give various kinds of discounts to its customers. This is normal. But we confuse that with financing.

The Problem of Loan Policy

MR. MCPHERSON: I very much agree with both Carol and George that we have not focused enough on loan policy. Even under some kind of utopian scheme--in which all institutional subsidies are eliminated, full-cost pricing is established at all institutions, and all student aid is need-based--an effective loan program would still be required, as I'm sure even the most doctrinnaire economist would agree. If such a program were to be efficient, some kind of device for risk-sharing on the investment would be necessary. The student takes a terrible chance when he borrows money; the college education may not pay off, but the loan must still be repaid. The idea of income-contingent loans, which we have not really discussed today, is very important.

MR. WEATHERSBY: You can actually sell stock in students.

MR. MCPHERSON: That is what income-contingent loans come down to.

MR. KUCH: The existing loan programs do, for the most part, include some kind of subsidy. That is, there is a hiatus--over the formal schooling period plus nine months--during which no interest is paid. Compared with a loan scheme that involves payments as soon as the loan is made, that constitutes a sizable subsidy. Apart from the issue of whether the payment rate bears any relation to the market rate of interest, the question seems to be: Does an individual over his lifetime conceivably have the resources to finance a college education if he can borrow? If not, there is an argument for nonrepayable grants. But if the problem is simply one of liquidity--and if the family unit has enough lifetime earnings to finance the college education of two or three children--then the question becomes, What type of loan is appropriate?

What is not clear (as Carol has pointed out) is whether the middle-class faces a problem of liquidity that could be met by some sort of non-subsidized loan scheme (such as has already been initiated by some institutions in that they are making loans to middle-income parents) or

whether the problem is one where, even considering lifetime earnings, the middle-income family would have to make inordinate sacrifices to send more than one child to college. That issue has not really been addressed, and the federal government is somewhat confused about just what the problem is.

Finally, in talking about risk-sharing and buying stock in students, we raise the whole issue of a student loan bank, which could market its shares much as Sallie Mae does. If the question is one of access to liquidity capital, can this national need be met through loan money from the private sector (as is now done with NDSL and GSL), or is something like a student loan bank required? Many people have proposed such a bank, but at the moment it does not seem to be a viable alternative.

MR. HUGHES: Right now, federal policy seems to be to target grants on lower-income people and to target loans on middle-income and upper-middle-income people. Is that fair?

MR. KUCH: That has been the policy until recently. Now the eligibility level has been raised up to a net adjusted income of $25,000, which I assume amounts to a gross income of slightly more than $30,000. That change may in fact increase the availability to the middle class. One of the arguments was that lenders in the private sector would not make nonsubsidized loans because of the inherent administrative problems and because the federal government would not share in the administrative costs. But that presents another problem, not immediately relevant here.

The Issue of Legislative Intent

MS. NELSON: I would like to respond to the comment that all economists care about is efficiency and that in their eyes a wasted dollar is the worst kind of scandal. I dispute that. What economists really care about, and what I looked at in my vocational education study, is the total policy process of the 1960s and 1970s, the intent of federal legis-

lation. In many cases, federal and state descriptions of objectives for vocational education were very close to the criteria that economists have for an efficient and equitable system. Perhaps the language is different, but the main themes are the same. Government policy-makers had very specific objectives for vocational education and have been consistently disappointed with the failure to attain these objectives.

Now I want to deal more specifically with the question, What are the issues? This question relates to my own reasons for thinking that the two-price market is not an irrelevant matter and for questioning whether we can afford to stand by and watch private institutions go down.

First, one of the objectives of policy-makers was to extend access to vocational education. But most of the money for vocational education now goes to the middle-class suburbs, not to inner-city neighborhoods, even though Congress had a tremendous concern for equity. The reason for this discrepancy between intention and actuality is that middle-income students who might otherwise have gone to proprietary schools or entered union apprenticeships or work training perceived an advantage in having such a school in their neighborhood. One example of what happened is in Massachusetts, where Blue Hills Vocational-Technical Institute was opened, primarily (it was assumed) for the benefit of the problem low-income student. Middle-income students found out about it. It was a great boon to them. Gradually, admissions standards rose, and now Blue Hills has come to be one of the "Ivy League" among vocational schools. Congressmen want to know why, when the money was supposed to benefit low-income students, it is going to benefit relatively high-income students.

Second, I want to respond to those who ask why it matters that private institutions are being driven out of business by the expansion of the public sector. It matters for several reasons. One is the

question of efficiency. Studies comparing the private and the public sector have repeatedly found that the same quality of service costs more in the public sector. Take garbage collection: In New York and other cities, the public unions charge more per ton than do private services. In Massachusetts, Boston urban transit could no longer run because of the high union wage rate; so they went to a private market service.

Other issues arise, of course. It may be that some private firms do not pay equitable wages, so for reasons of social equity, we may prefer public services. On the other hand, $19,000 incomes for street sweepers in San Francisco strike me as a little excessive. Thus, a shift from private firms to public agencies--or from private to public institutions--will probably involve much higher costs, partly because of salaries and partly because public institutions tend to have more in the way of facilities and equipment. One popular joke about proprietary schools is that if you take the average college president's office and divide it in half, you have a proprietary school.

My final point comes from my own reading of the proceedings of hearings, of the GAO report, and of other evaluations at the federal level. I get a sense of exasperation at local public schools and community colleges because of their failure to do what is in the interests of the students. Student groups tell us that these schools should offer programs on weekends and at night; that they should have shorter programs; that they should provide placement services. Why aren't the public schools answering these needs, as the private institutions--which are under much stronger market pressures--are.

Let me repeat my points again. First, there is a real concern over equity in the use of public money: Why should some people and not others get public money? Second, there is the question of resource loss; public institutions do cost more for the same quality of service than do private institutions. That may not always be the case,

but there are plenty of examples. Finally, public institutions may simply not be sufficiently responsive to what federal policy-makers want; since local competitive market pressures on them are also very weak, they may offer only their own misperceptions of what should be offered.

In my vocational education study, I made a very conscious effort to go beyond abstract economic notions of value and efficiency and to learn what it is that advisory groups, policy-makers, and students themselves say they want. Again, I grant that vocational education is somewhat simpler than higher education; nonetheless, I think that approach can be combined with what really is a straightforward set of objectives in a market model that relates to those in some fashion.

What Are the Policy Implications?

MS. SMITH: I think you have made some very good points. One of the problems is that Congress seems to go at everything backwards: They start something for the wrong reasons, and then they blame everybody else in the world for the monster they have created.

I am convinced that Congress refuses to think in terms of saving private institutions, or of keeping tuitions low at public institutions, or whatever. They simply don't want to get involved in those issues. They want to know how many students a given program is going to help.

All I am trying to say is that we need a more educated electorate and a more educated Congress. In the meantime, Congress is raising a lot of questions about the campus-based programs, asking why such programs are needed when BEOGs exists. If anyone here has any bright ideas about how to answer this question, please write and let us know.

The federal government has suddenly become very concerned about the middle-income group. It really doesn't seem to matter whether there is actually a middle-income squeeze or not; the point is that some members of Congress have become convinced that such a squeeze exists. There has

even been some talk about a tuition tax credit, which would have a very high price tag on it. Perhaps we ought to lobby as hard as we can for the campus-based programs, hoping that there will be some discretion at the institutional level to use this money in a way that will benefit both students and institutions. In terms of ACE's vested interests, I think we are trying to save all the institutions, or at least some of all of them, and at the same time to help the students as much as possible. So if any of the researchers here today have any further data on how federal student aid money will affect the choice behavior of middle-class students, I hope they will let us know. We need to know more about the impact of different types of aid on students at different levels, but particularly at the middle-income level. How much do loans or work-study grants influence such students? So if any of you have any information that you could give us, for policy purposes, it would be very helpful. I hope that all of you longer-term thinkers can come up with some longer-term answers for us.

MR. HUGHES: Now that Pat has given us the policy significance of our discussion, I think it would be safe to close. I would like to thank the participants for their contributions and for their persistence and diligence in the meeting today.

TABLES

TABLE 1

PRICE RESPONSE COEFFICIENTS BY TYPE OF INSTITUTION AND FAMILY INCOME

(¢/$100)

Income Group	Institutional Sector		Public Two-Year	Public Four-Year			Private Two-Year	Private Four-Year			Noncollegiate
				Lower Div.	Upper Div.	Grad. & Prof.		Lower Div.	Upper Div.	Grad. & Prof.	
	Public 2-Yr.		-2.950	.321			.218	.161			.218
	Public 4-Yr.	LD	.509	-3.130			.218	.161			.218
Low-		UD			-3.130				.161		
Income		G&P				-3.130				.161	
Students											
(Less than	Private 2-Yr.		.509	.321			-3.240	.161			.218
$7,500)	Private 4-Yr.	LD	.509	.321			.218	-3.260			.218
		UD			.321				-3.260		
		G&P				.321				-3.260	
	Noncollegiate		.509	.321			.218	.161			-3.240
	Public 2-Yr.		-1.230	.149			.087	.126			.087
	Public 4-Yr.	LD	.130	-1.220			.087	.126			.087
Middle-		UD			-1.220				.126		
Income Students		G&P				-1.220				.126	
($7,500	Private 2-Yr.		.130	.149			-1.280	.126			.087
to	Private 4-Yr.	LD	.130	.149			.087	-1.240			.087
$15,000)		UD			.149				-1.240		
		G&P				.149				-1.240	
	Noncollegiate		.130	.149			.087	.126			-1.280
	Public 2-Yr.		-.750	.092			.046	.089			.046
	Public 4-Yr.	LD	.058	-.710			.046	.089			.046
High-		UD			-.710				.089		
Income Students		G&P				-.710				.089	
(Over	Private 2-Yr		.058	.092			-.760	.089			.046
$15,000)	Private 4-Yr.	LD	.058	.092			.046	-.710			.046
		UD			.092				-.710		
		G&P				.092				-.710	
	Noncollegiate		.058	.092			.046	.089			-.760

TABLE 2

COLLEGE APPLICATIONS, ACCEPTANCES, AND ATTENDANCE OF NLS STUDENTS

	Number	Percent of Total	Percent of Applicants	Percent of Subgroup	Attending					Not	College Acceptance Rate	College Attendance Rate
					First Choice	Second Choice	Third Choice	Other College	Other School			
No Applications	2,961	57.2	--	100.0	--	--	--	22.4	9.8	67.8	--	22.4
One Applications	1,316	25.4	59.3	100.0	61.0	--	--	7.5	4.6	26.9	95.7	68.5
R	56	1.1	2.5	4.3	--	--	--	20.3	26.9	52.8		
A	1,260	24.3	56.8	95.7	63.7	--	--	7.0	3.6	25.7		
Two Applications	542	10.5	24.4	100.0	43.8	27.5	--	9.1	4.2	15.3	97.4	80.5
RR	13	0.3	0.6	2.4	--	--	--	65.3	3.3	31.4		
RA	56	1.1	2.5	10.3	--	57.9	--	8.5	7.9	25.7		
AR	41	0.8	1.8	7.6	72.4	--	--	9.1	3.7	14.8		
AA	431	8.3	19.4	79.5	48.2	27.0	--	7.5	3.8	13.5		
Three Applications	360	7.0	16.2	100.0	44.3	20.5	14.4	6.3	1.2	13.4	98.6	85.4
RRR	5	0.1	0.2	1.4	--	--	--	77.2	0	22.8		
RRA	9	0.2	0.4	2.5	--	--	54.8	34.2	0	11.0		
RAR	7	0.1	0.3	1.9	--	83.6	--	5.5	0	10.9		
RAA	40	0.9	2.2	13.3	--	56.6	20.4	6.1	0	16.9		
ARR	11	0.2	0.5	3.1	78.1	--	--	11.0	0	10.9		
ARA	27	0.5	1.2	7.5	54.9	--	26.7	9.1	0	9.3		
AAR	31	0.6	1.4	8.6	67.6	22.6	--	0	3.2	6.6		
AAA	221	4.3	10.0	61.4	51.7	15.4	13.5	3.8	1.4	14.2		
Total Applicants	2,218	42.8	100.0	--	54.1	10.1	2.5	7.6	3.9	21.8	96.7	74.3
TOTAL	5,179	100.0	--	--	23.2	4.3	1.1	16.1	7.3	48.1	--	44.6

NOTE: "ARR" denotes acceptance at the first-choice college, rejection at the second-choice college and rejection at the third-choice college.

TABLE 3

SIMPLIFIED REGRESSION OF ATTENDANCE ON BACKGROUND AND TYPICAL-APPLICATION CHARACTERISTICS FOR STUDENTS FROM DIFFERENT REGIONS

Student Characteristics	Region			
	Northeast	North Central	South	West
Black/Mexican	-.01598	.10490	-.07656	.09059
Socioeconomic class	.05563	.09619*	.02432	.05711
Parents' income	-.00014	-.00045	.00009	.00006
No religion	-.12919	-.12586	.05229	-.06355
College-bound	.00171*	.00173	.00040	-.00005
Farm families	.00445*	-.00150	-.00472*	.00099
Imputed grade-point average	.00817	.00922	.01554	.00792
Friends' college plans	.07282	.02249	.12518*	.07659
Student's occupational plans	.00085	.00260*	.00101	.00196
Home-maker	-.36756	-.08227	-.11899	-.09958
Military	-.16122	.51023*	-.01610	-.32904
Educational aspirations	.02435*	.02421	.03189*	-.00031
Plans to attend academic institution	.47442*	.42138*	.21754*	.30246*
Plans to attend voc-tech institution	.18506*	.27939*	.07632	.22564*
Plans to attend private institution	-.00712	-.04708	-.07580	-.02061*
ACT scores	.00767	.00276	-.00026	.01289
Same state	-.00205	.10404*	-.02905	.14623*
Total cost	-.00271	.00081	-.00068	.00046
Total aid	-.00650	-.01378	.00442	-.00597
Grant assistance	.07959	.13681	.05859	.10185
Constant	-.21237	-.33779	.16301	-.21508
R^2	.27692	.25949	.20173	.18172

*Denotes significance at the 0.05 level.

TABLE 4

SIMPLIFIED REGRESSION OF ATTENDANCE ON BACKGROUND AND TYPICAL-APPLICATION CHARACTERISTICS FOR STUDENTS WITH DIFFERENT GRADES

Student Characteristics	High School Grades			
	F - D	C	B	A
Northeast	-.17491	-.01629	.04468	-.08102
South	-.20991	-.00334	.00333	-.10362*
North Central	-.12833	-.02598	.00366	-.08893
Black/Mexican	-.11080	.07645	-.05752	.03761
Socioeconomic class	.06052	.09222*	.04554	-.00097
Parents' income	-.00046	-.00054	.00028	.00025
No religion	.07868	-.08643	-.02517	-.14166
College-bound	-.00003	.00248*	-.00021	.00104
Farm families	.00097	-.00110	-.00213	-.00041
Imputed grade-point average	.02955	-.00286	.04126	.01609
Friends' college plans	.01786	.11424*	.09520*	.04467
Student's occupational plans	-.00164	.00282*	.00084	.00271*
Home-maker	-.16430	.17537	-.16058	-.04468
Military	-.05998	-.07335	-.02963	.21415
Educational aspirations	.06900*	.01423	.03266*	-.01457
Plans to attend academic institution	.29662*	.33215*	.32829*	.42503*
Plans to attend voc-tech institution	.06346	.19453*	.15113*	.23368*
Plans to attend private institution	-.12255	-.06389	.06889	-.07227
ACT scores	.01950	.01089	-.00139	.01092
Same state	-.04416	-.00821	.08484*	.09893*
Total cost	-.00574	-.00042	-.00276	.00158
Total aid	-.00221	-.00729	-.01108	.00082
Grant assistance	.18120	.08390	.13504*	.05332
Constant	-.03879	-.27787	-.23013	-.18032
R^2	.08371	.22479	.17532	.21256

*Denotes significance at the 0.05 level.

TABLE 5

SIMPLIFIED REGRESSION OF ATTENDANCE ON BACKGROUND AND TYPICAL-APPLICATION CHARACTERISTICS FOR STUDENTS WITH DIFFERENT SOCIOECONOMIC BACKGROUNDS

Student Characteristics	Socioeconomic Background		
	Low	Middle	High
Northeast	-.08535	-.05041	-.00714
South	-.08297	-.06455	-.00375
North Central	-.10721	-.04636	-.03856
Black/Mexican	-.06855	.05078	.09577
Parents' income	-.00513	-.00008	-.00003
No religion	-.06192	-.10610	-.03751
College-bound	.00166	.00186*	.00004
Farm families	-.00305*	-.00069	-.00140
Imputed grade-point average	.01777	.00757	.00363
Friends' college plans	.11418	.05148	.10946*
Student's occupational plans	.00115	.00158*	.00118
Home-maker	.20723	-.28455	-.21573
Military	-.22621	-.02974	-.07006
Educational aspirations	.05285*	.00853	.01633
Plans to attend academic institution	.31073*	.41803*	.19845*
Plans to attend voc-tech institution	.21431*	.17507*	.08450
Plans to attend private institution	-.04279	-.09911	-.00147
ACT scores	.01188	.00639	.00604
Same state	.06304	.07624*	-.01984
Total cost	-.00237	.00108	-.00204
Total aid	-.00305	-.00445	-.00346
Grant assistance	.15372*	.06837	.02911
Constant	-.19105	-.04656	.31223
R^2	.28683	.20881	.08926

* Denotes significance at the 0.05 level.

TABLE 6

SELECTED CHARACTERISTICS OF APPLICATIONS, BY ACCEPTANCE, PREFERENCE, AND CHOICE

Institutional Characteristics	(1) Accepted M	(2) Accepted SD	(3) All M	(4) Rejected M	(5) Chosen M	(6) Chosen SD	(7) Single Appl.	(8) Two Applications All	(9) Two Applications #1	(10) Two Applications #2	(11) Three Applications All	(12) Three Applications #1	(13) Three Applications #2	(14) Three Applications #3	(15) Summer Applications Only	(16) Summer Applications After #1	(17) Summer Applications After #2	(18) Summer Applications After #3
Private	.1469	.3540	.1607	.3178	.1276	.3338	.0981	.1593	.1598	.1587	.2465	.2635	.2678	.2083	.0798	.1185	.2185	.3534
Public	.7245	.4468	.7141	.5949	.7387	.4394	.7968	.6961	.6779	.7143	.6010	.5670	.5937	.6423	.8025	.7324	.6601	.4815
Less than BA	.2970	.4570	.2770	.0560	.3521	.4777	.3988	.1914	.1648	.2180	.0951	.0655	.0866	.1333	.4774	.6019	.3796	.2305
Doctorate	.3258	.4687	.3395	.4912	.2840	.4511	.2827	.3855	.4086	.3654	.4465	.4553	.4158	.4685	.1799	.1558	.3912	.2745
Enrollment	7.8387	7.9073	8.0063	9.8958	7.3597	7.5259	7.2606	8.3689	8.3[illegible]9	8.4138	8.6959	8.7346	8.4521	8.9009	7.3820	6.0437	8.0634	7.1713
A C T	21.2714	3.1950	21.4753	23.7500	21.0006	3.0825	20.5960	21.5467	21.7114	21.3819	22.8830	23.2660	22.9816	22.4013	20.2708	19.9083	20.8417	21.9064
Prestige	3.5767	2.4986	3.7824	6.0957	3.2779	2.4392	2.9358	3.9282	4.0557	3.8026	4.9799	5.2204	5.0290	4.6895	2.6374	2.5465	3.2485	4.1986
Total Cost	14.1056	11.8872	14.639	20.5525	13.2865	11.5066	12.1161	14.9071	15.4687	14.3454	18.5252	19.0390	18.5551	17.9816	11.2186	10.5882	11.8651	19.8143
Tuition & Fees	8.3593	7.9651	8.6607	12.0011	7.8909	7.6379	7.1322	8.54[illegible]0	8.8533	8.2287	11.2369	11.2845	11.4137	11.0135	6.6558	6.5961	7.6248	13.5206
Distance	3.6450	6.076	3.6497	3.7017	3.4569	5.7215	3.6791	3.8215	3.7951	3.8479	3.5720	3.8370	3.4761	3.2673	3.4172	3.7278	3.3164	6.4818
Same Place	.1022	.3030	.1986	.0590	.1058	.3077	.1118	.0932	.0897	.0966	.0907	.0614	.1039	.1068	.0986	.1244	.1798	.2527
Total Aid	2.1907	5.9399	--	--	2.6800	6.2121	1.8827	2.2051	2.6283	1.7819	2.34[illegible]8	3.7354	1.9932	1.3027	2.3685	1.6754	4.1555	6.7919
Some Aid	.2315	.4219	--	--	.2805	.4439	.2381	.2145	.2222	.2067	.1992	.2854	.1776	.1346	.2579	.2896	.4504	.4325
Net Cost	12.4413	11.3923	--	--	11.2457	10.8099	10.7924	13.2283	13.4122	13.0443	16.6266	16.2310	16.8219	16.8269	9.3697	9.1105	9.4065	14.5790
N	(N=3956)		(N=4313)	(N=357)	(N=2311)		(N=1316)	(N=1084)	(N=542)	(N=542)	(N=1080)	(N=360)	(N=360)	(N=360)	(N=665)	(N=99)	(N=46)	(N=23)
N Rejected							56	124	69	55	177	69	53	55				
Percent							4.3	11.4	12.7	10.1	16.4	19.2	14.7	15.3				
N Attended							803	--	237	149	--	159	74	52				
Percent							61.0	--	43.8	27.5	--	44.3	20.5	14.4				

NOTE: Columns 1 and 2 describe applications not rejected by colleges, according to students' reports in October 1973. Column 3 gives means including rejected applications. Column 4 gives means for rejected applications only. Columns 5 and 6 describe the college attended. Columns 7 through 18 give means for applications broken down by number of applications filed and post hoc reports of preference. These means are based on accepted applications only; thus the sample sizes for these columns are the "N" line minus the "N Rejected" line. Data for rejected or nonselected summer applications were not available.

TABLE 7

REGRESSION OF CHOSEN ON ACCEPTED APPLICATION CHARACTERISTICS BY STUDENTS' SOCIOECONOMIC BACKGROUND AND IMPUTED AVERAGE

Institutional Characteristics	Socioeconomic Background			Imputed Average			
	Low	Middle	High	F/D	C	B	A
Total Cost							
Own	-.00406	.00024	-.00374	-.00650	-.00111	-.00339	-.00032
Other	-.00017	-.00505*	.00191	.00378	-.00046	-.00019	-.00292
Total Aid							
Own	.00088	.00406	.00420	.02068	.00218	.00382	.00576
Other	.00166	-.01069*	-.00333	-.02242	-.00425	-.00415	-.00849
Some Aid							
Own	.25091*	.32882*	.31809*	.21632	.39982*	.32656	.15011
Other	-.27658*	-.26664*	-.34077*	-.22920	-.34632*	-.31115	-.18524*
Distance							
Own	.00462	-.00547	-.00249	-.03005	-.00315	-.00694	-.00013
Other	.00336	.00640	.00044	.03701	.00483	.00478	-.00049
Public							
Own	.03995	-.03467	-.14644*	-.20047	-.15309*	-.02098	-.01435
Other	.05169	.01146	.07697	.24946	.18459*	-.04616	-.04617
A C T							
Own	.03220*	-.00074	-.01685	-.01208	-.00160	.00621	-.02152
Other	-.02249	.02177*	.01738	.01994	.00695	.00547	.02200
Enrollment							
Own	.00010	-.00254	-.00517*	.01089	-.00813*	-.00014	-.00836*
Other	-.01262	.00055	.00554*	-.01106	.00520	-.00056	.00513
Less than BA							
Own	.00069*	.30839*	.16697*	.18381	.26598*	.22372	.17336
Other	-.24320	-.24566*	-.12468	-.12617	-.19398*	-.18318	-.21545*
Constant	.32760	.04024	.47591	.24657	.29426	.25857	.56190
R^2	.09489	.23965	.15611	.18179	.31038	.11119	.12302

*Denotes significance at the 0.05 level.

TABLE 8

CHARACTERISTICS OF LOCAL HIGHER EDUCATION ENVIRONMENT

1. Distance to nearest public two-year college: 1-999 miles
2. Distance to nearest public four-year college: 1-999 miles
3. Distance to nearest low-selectivity public university (selectivity < 1020; prestige < 5): 1-999 miles
4. Distance to nearest high-selectivity public university (selectivity ≥ 1020; prestige ≥ 5): 1-999 miles
5. Distance to nearest black college: 1-999 miles
6. Number of low-selectivity private colleges within 25 miles (selectivity < 1050): 1-9
7. Number of medium-selectivity private colleges within 25 miles (selectivity = 1050-1175): 1-9
8. Number of high-selectivity private colleges within 25 miles (selectivity > 1175): 1-9
9. Distance to nearest low-selectivity Catholic college (selectivity < 1050): 1-999 miles
10. Distance to nearest high-selectivity Catholic college (selectivity ≥ 1050): 1-999 miles
11. Number of low-selectivity Protestant colleges within 25 miles (selectivity < 1050): 1-9
12. Number of high-selectivity Protestant colleges within 25 miles (selectivity ≥ 1050): 1-9

Table 9

STUDENT TYPOLOGY

Sex: men, women

Race or Ethnicity: white, black, Asian-American or Oriental, Chicano or Mexican-American, Puerto Rican, American Indian or native American

Income Level: low = less than $8,000; moderate = $8,000-$19,000; high = $20,000 or higher

Ability Level: low = lowest 25%; moderate = middle 50%; high = highest 25%. An approximate cutting point for low-ability students would be SAT Verbal + Math, 860 (or ACT Composite, 19); for high-ability students, the cutting-point would be SAT Verbal + Math, 1150 (or ACT Composite, 26).

TABLE 10

INSTITUTIONAL TYPOLOGY

Predominantly White		Predominantly Black	
Public	Private	Public	Private
Two-year college	Two-year college	Two-year college	Two-year college
Four-year college	Four-year college, religious affiliation (selective)	Four-year college or university	Four-year college or university
University (selective)	Four-year college, religious affiliation (other)		
University (other)	Four-year college, independent (highly selective)		
	Four-year college, independent (selective)		
	University (highly selective)		
	University (selective)		
	University (other)		

TABLE 11

COLLEGE CHOICES IN SENIOR YEAR AND COLLEGES ACTUALLY ENTERED, BY ABILITY LEVEL

Ability Level (SAT V + M)	Percentage Whose First Two College Choices in 12th Grade Are				Percentage Entering		
	Public-Private	Private-Public	Both Public	Both Private	First-Choice College	Public College	Private College
1200+	16	16	24	43	38	40	60
1050 - 1199	17	18	37	28	41	51	49
900 - 1049	17	18	42	23	42	56	44
Less than 900	16	17	49	18	42	60	40

TABLE 12

DISTANCE FROM HOME TO COLLEGE, BY ABILITY LEVEL

Ability Level (SAT V + M)	Distance From Home to College (In Miles) For Student Enrolling In	
	Public Colleges	Private Colleges
1200+	264	326
1050 - 1199	189	272
900 - 1049	139	237
Less than 900	111	201

TABLE 13

ENTRY TO FIRST-CHOICE COLLEGE AS A FUNCTION OF COST AND DISTANCE: STUDENTS PREFERRING PUBLIC COLLEGES AS FIRST AND SECOND CHOICES

Ability Level (SAT V + M)	Entered First-Choice College?	Mean Difference* Between First and Second Choice In	
		Tuition and Fees	Miles From Home
1200+	Yes	$-53	-10
	No	- 9	69
1050 - 1199	Yes	-10	-38
	No	-11	14
900 - 1049	Yes	8	-59
	No	-19	11
Less than 900	Yes	2	-51
	No	7	3

*First choice minus second choice.

TABLE 14

ENTRY TO FIRST-CHOICE COLLEGE AS A FUNCTION OF COST AND DISTANCE: STUDENTS PREFERRING PRIVATE COLLEGES AS FIRST AND SECOND CHOICES

Ability Level (SAT V + M)	Entered First-Choice College?	Mean Difference* Between First and Second Choice in	
		Tuition and Fees	Miles From Home
1200+	Yes	$ 19	-33
	No	19	27
1050 - 1199	Yes	58	-31
	No	40	28
900 - 1049	Yes	- 41	-39
	No	35	18
Less than 900	Yes	-103	-48
	No	8	32

*First choice minus second choice.

TABLE 15

ENTRY TO A PUBLIC VERSUS PRIVATE INSTITUTION AS A FUNCTION OF COST AND DISTANCE: STUDENTS WITH FIRST CHOICE PUBLIC AND SECOND CHOICE PRIVATE

Ability Level (SAT V + M)	Entered Public College?	Mean Difference* Between First and Second Choice in	
		Tuition and Fees	Miles From Home
1200+	Yes	$-1,900	-121
	No	-1,830	- 14
1050 - 1199	Yes	-1,650	- 35
	No	-1,640	- 9
900 - 1049	Yes	-1,500	- 48
	No	-1,480	- 10
Less than 900	Yes	1,210	- 25
	No	1,330	- 34

*First choice minus second choice.

TABLE 16

ENTRY TO A PUBLIC VERSUS PRIVATE INSTITUTION AS A FUNCTION OF COST AND DISTANCE: STUDENTS WITH FIRST CHOICE PRIVATE AND SECOND CHOICE PUBLIC

Ability Level (SAT V + M)	Entered Private College?	Mean Difference* Between First and Second Choice in	
		Tuition and Fees	Miles from Home
1200+	Yes	$1,870	36
	No	1,800	42
1050 - 1199	Yes	1,770	44
	No	1,560	22
900 - 1049	Yes	1,470	70
	No	1,390	11
Less than 900	Yes	1,230	6
	No	1,220	14

*First choice minus second choice.